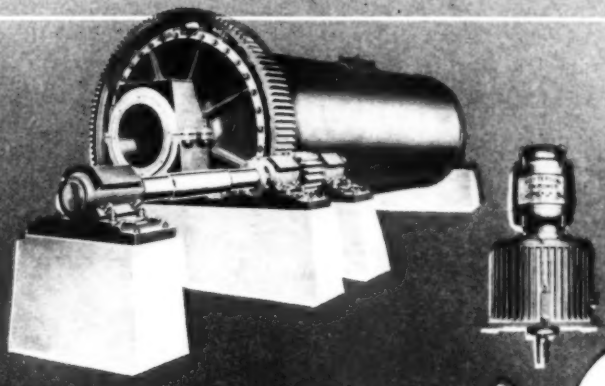
CHNOLOGY DEPARTMENT

PUBLIC LIBRARY

THE PAPER INDUSTRY and PAPER WORLD

EDUCATIONAL NEWS MAGAZINE—FEBRUARY, 1947

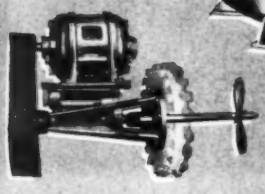
SERVING PROGRESSIVE PAPER MILLS WITH CONSISTENT TOP PERFORMANCE



PATTERSON

SATISFACTORY

MACHINERY



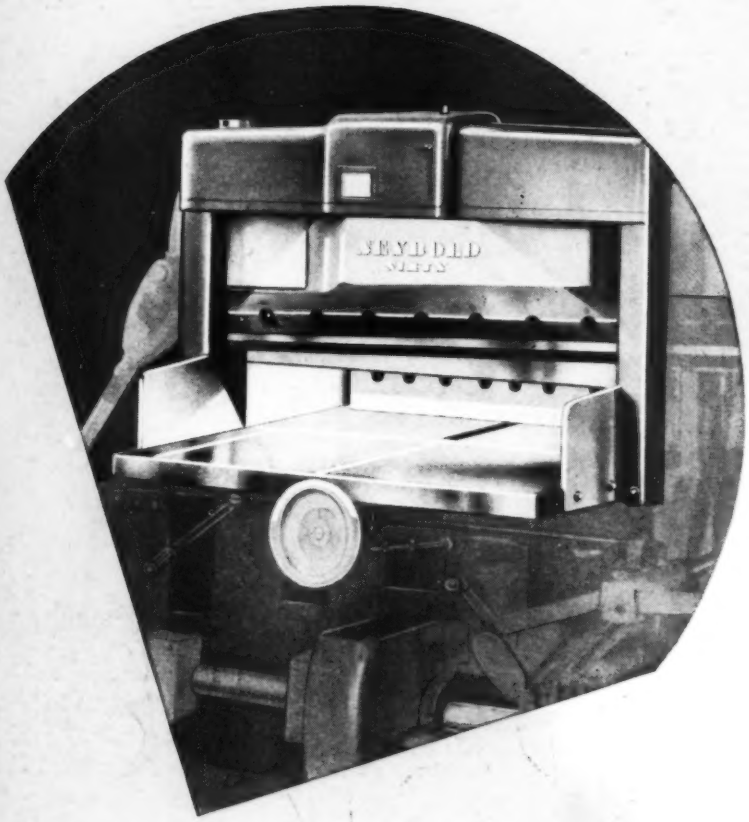
will profitably maintain volume and quality standards at lowest operating costs.

Richard L. Cummings
President

THE PATTERSON FOUNDRY & MACHINE CO.
EAST LIVERPOOL, OHIO, U.S.A.
IN CANADA
THE PATTERSON FOUNDRY & MACHINE CO. (CANADA) Ltd.
TORONTO, ONTARIO

NOW...A PAPER CUTTING MACHINE WITH

Plenty of Light Where It Is Needed Most



That's why Trimming is SAFER...SURER...

WITH A

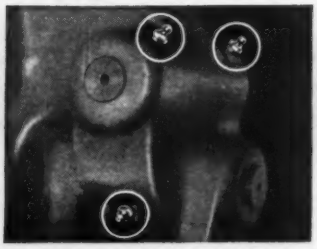
Seybold "Sixty"

Few operating features give a mill trimmer or spacer operator a greater lift than one which provides shadowless, glare-free illumination over the entire work area. Also, few factors contribute more directly to greater accuracy, safety and increased production.

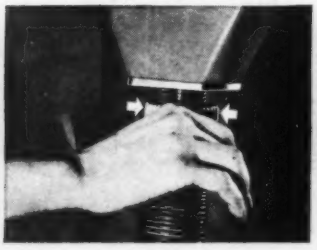
The new Seybold "Sixty" Mill Trimmers and Spacers feature soft, directed illumination from side gauge to side gauge—and from hand wheel to line of cut. Maximum ease for accurate gauging is assured by plenty of light on the magnified measuring band.

Proper lighting is but one of five definite operating advantages you get with a Seybold "Sixty" Paper Cutting Machine. Advantages which increase production because they conserve the operator's time and energy. Be sure you get all five on your next machines.

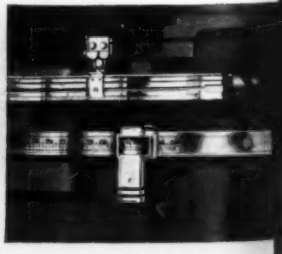
CONTROLLED BY FOOT PEDALS: A simple pumping motion changes clamping pressure instantly. No tools are needed. Saves time. Saves energy. A shadow gauge registers the pressure reading.



EASILY LUBRICATED: Zerk fittings are provided for cleaner, easier, more permanent lubrication. Lubrication points are out in the open, encouraging more thorough lubrication.



SIMPLE, QUICK KNIFE ADJUSTMENT: A turn of the knurled collar on pull bar adjusts knife to cutting stick. No tools are necessary. Self-locking. Adjusts to the thickness of one sheet.



FASTER AUTO-SPACERS: Automatic move stock into position at a fa rate than ever before. Cut stops can set, at one time, to make all cuts nec sary on several jobs.

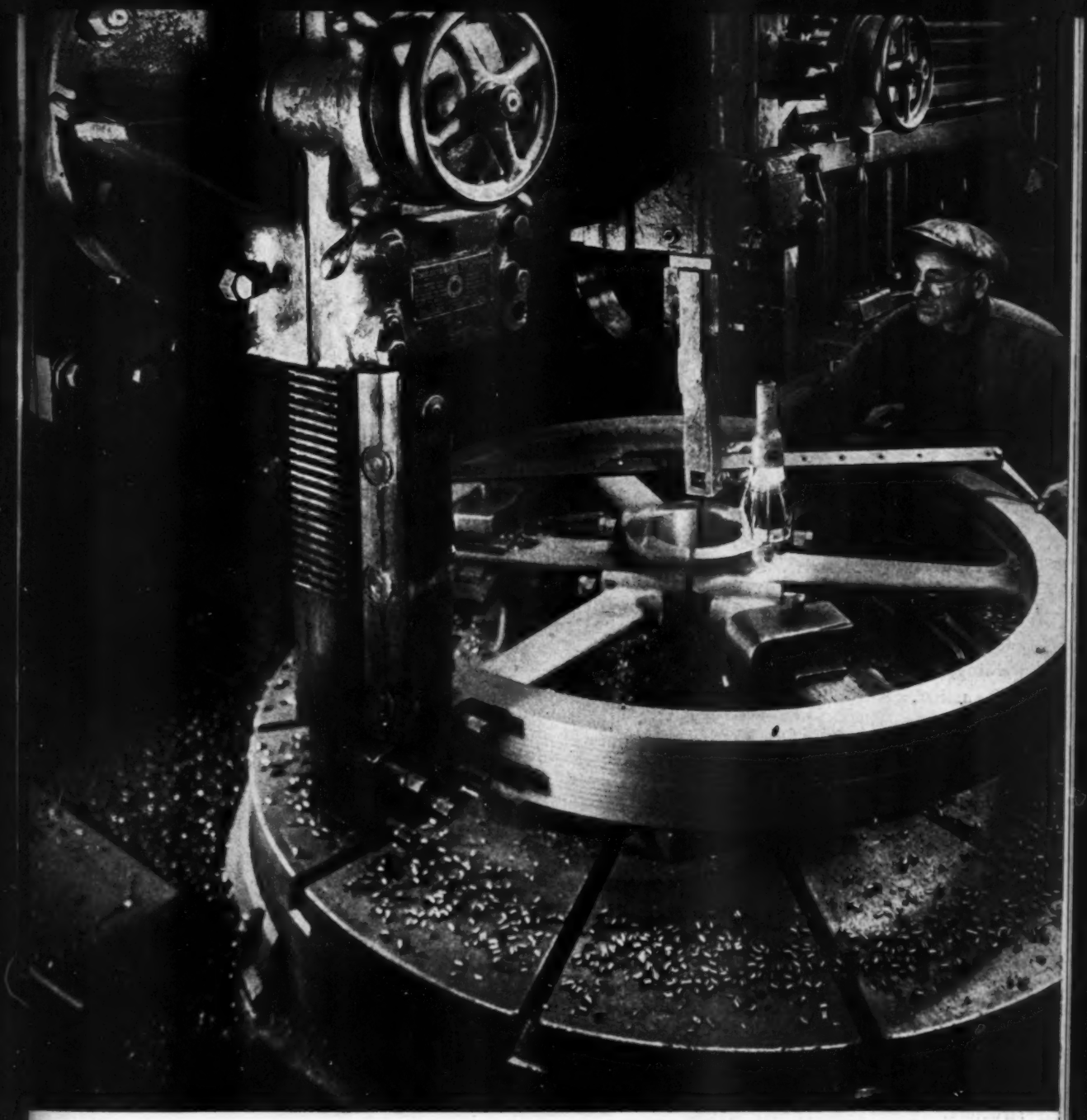
HARRIS-SEYBOLD

Harris-Seybold Company • General Sales Offices, Cleveland 5, Ohio

HARRIS PRESSES • SEYBOLD MILL TRIMMERS AND AUTO-SPACERS • OTHER GRAPHIC ARTS EQUIPMENT

Backed up by the world's largest and most highly-skilled, factory-trained paper cutter service organization.

Backed up by the world's largest and most highly-skilled, factory-trained paper cutter service organization.



Every part a special problem

Boring-mill operator C. J. Connor, here seen machining the face of a dryer gear blank, has been with Beloit Iron Works for over 12 years. Design improvements constantly are incorporated, but the workmanship remains the same. Fine craftsmen, making fine paper machinery, have a way of staying with Beloit, year after year. Beloit traditions go back to 1858! *Beloit Iron Works, Beloit, Wisconsin.*

BELOIT

PAPER MACHINERY

BELOIT IRON WORKS · PAPER MACHINERY · BELOIT, WIS., U.S.A.

WHEN YOU BUY BELOIT...YOU BUY MORE THAN A MACHINE!

INCIDENTS FROM SMITHway PRESSURE VESSEL RESEARCH

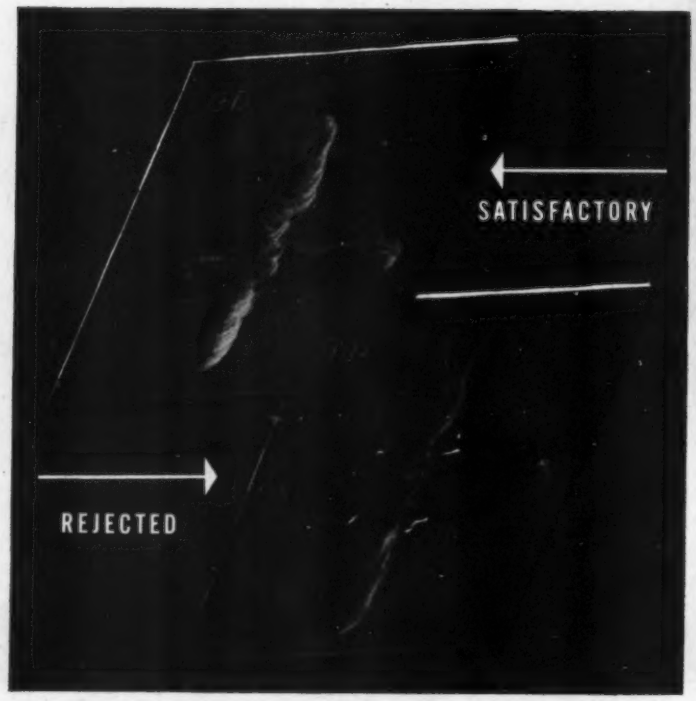
PROJECT No. 2229

Successive heats of the same alloy react differently to corrosion

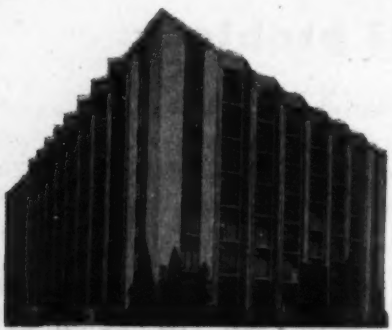
SO COMPLEX is the service to which modern equipment is subjected that it is no longer safe to predict the corrosion resistance of an alloy steel, *after* fabrication and welding, on the basis of the alloy's AISI type number.

At A. O. Smith, records of the Metallurgical Laboratory reveal an increasing number of instances in which successive heats of identical alloys behave quite differently, in service. Under these circumstances, achievement of assured dependability in performance requires much more than ordinary precautions, such as mill inspection and chemical analyses.

Today, utilizing data obtained over a ten-year period from many thousands of tests in A. O. Smith laboratories, it is possible to select from heats of the same alloy those which will meet specific requirements for corrosive service in the finally fabricated structure.



Results of corrosion tests on cross-welded plates of AISI Type 316 stainless steels from two heats of similar chemical analyses.

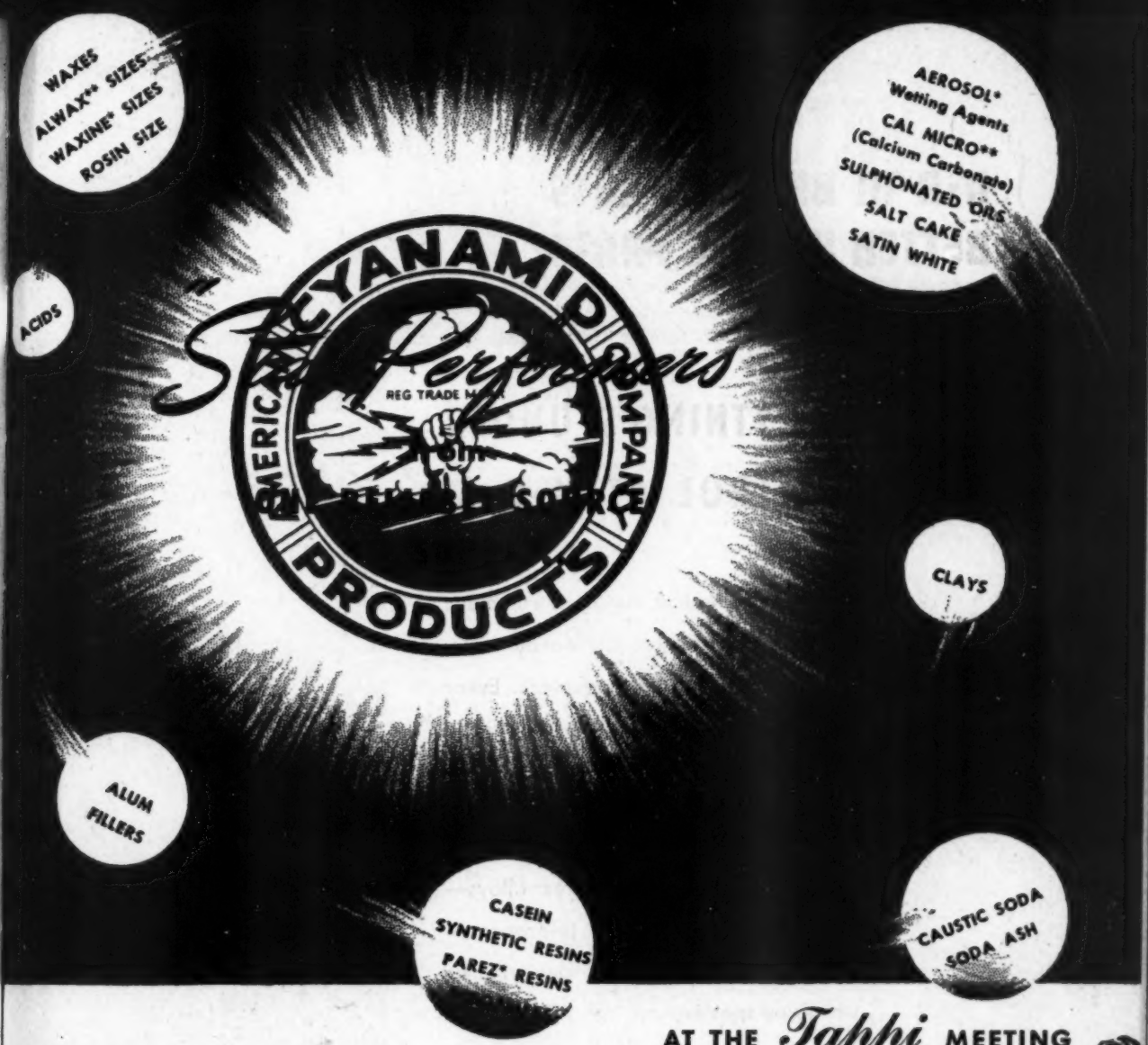


A. O. Smith Research and Engineering Building, Milwaukee

A. O. SMITH Corporation

New York 17 • Philadelphia 5 • Pittsburgh 19 • Cleveland 4 • Atlanta 3
Chicago 4 • Tulsa 3 • Midland 5 • Dallas 1 • Houston 2 • New Orleans 18
Seattle 1 • San Francisco 4 • Los Angeles 14
International Division: Milwaukee 1

MAKERS OF AUTO FRAMES • PRESSURE VESSELS • LINE PIPE • OIL-WELL CASING • BREWERY TANKS
WELDING EQUIPMENT • TURBINE PUMPS • PETROLEUM METERS • AND OTHER PRODUCTS



IN SUPPLY...

You can rely on Cyanamid for a wide range of chemicals and specialties for dependable paper-making results.

IN RESEARCH...

Cyanamid's timely developments in paper-making specialties help provide new opportunities for new markets for paper and paper products.

IN TECHNICAL SERVICE...

Our trained technical staff, experienced in paper chemistry and its practical application in the paper mill, is always ready to assist in working out your problems.

When Performance Counts . . . Call on Cyanamid

Industrial Chemicals Division

AMERICAN CYANAMID COMPANY

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

DISTRICT OFFICES: Boston, Massachusetts; Philadelphia, Pennsylvania; Baltimore, Maryland; Charlotte, North Carolina; Cleveland, Ohio; Chicago, Illinois; Kalamazoo, Michigan; Detroit, Michigan; St. Louis, Missouri; Azusa, California; Seattle, Washington. In Canada: Dilons Chemical Company, Ltd., Montreal and Toronto.

For low-cost chemical equivalent of distilled H_2O . . . FILT-R-STIL* Demineralizing Units.

*Reg. U. S. Pat. Off. **Trade Mark

AT THE *Tappi* MEETING look for . . .

EVERYTHING'S UNDER CONTROL AT N·B·M

All along the line, the latest automatic control devices are the final authority. We don't depend on guesswork. Every step is controlled and double-checked to eliminate any possible chance of human error.

Closer control means purer alloys—denser grain—closer tolerances——more uniformity—better performance when you specify

N·B·M BRONZE PARTS

We put more service into them—you get more service out of them

NBM

Brake Shoe COMPANY

NATIONAL BEARING DIVISION
ST. LOUIS · NEW YORK

PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

For low-cost chemical equivalent of distilled H_2O . . . FILT-R-STIL* Demineralizing Units.
*Reg. U. S. Pat. Off. **Trade Mark

THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

VOLUME 28 FEBRUARY, 1947 NUMBER 11

—FEATURES—

Pulp and Paper Outlook for 1947 1587
Kimberly-Clark Research and Development Organization ..... H. A. Rothchild 1591
Notes and Observations on Beaters—Part III ..... B. M. Baxter 1592
Glycerine's Expanding Roll in Paper Production ..... Georgia Leffingwell and Milton A. Lesser 1598
Canadian Associations Hold Annual Meetings 1602
Statements Relative to Reciprocal Trade Agreements 1640
Convention Papers . . . Abridged 1642

—NEWS—

True Greatness 1536
Trade Winds 1537
Associations 1602
Allied 1620
Safety 1624
Names in the News 1626
Personals 1626
Necrology 1634

—DEPARTMENTS—

Editorial 1571
Current Thought 1572
Paper Sketches 1600
Coming Events 1618
Safety Contest Scores 1624
Practical Shorts 1637
New Equipment and Supplies 1652
Technical Developments 1656
Papermaking Patents 1658
New Publications 1660
Current Market Quotations 1662
Index to Advertisers 1665

Published monthly by FRITZ PUBLICATIONS, INC., 59 East Van Buren Street, Chicago 5, Illinois

EDWARD B. FRITZ, Founder
A. SCOTT DOWD, President and Gen. Mgr.
HARRY E. WESTON, Editorial Director
A. C. BRUCE, Secretary
EDGAR C. FARREN, Production Manager
BESSE MERRITHEW, Editor
A. C. FRITZ, Vice Pres. and Treas.
G. E. VON ROSEN, Circulation Director
C. J. ELWELL, Circulation Field Rep.

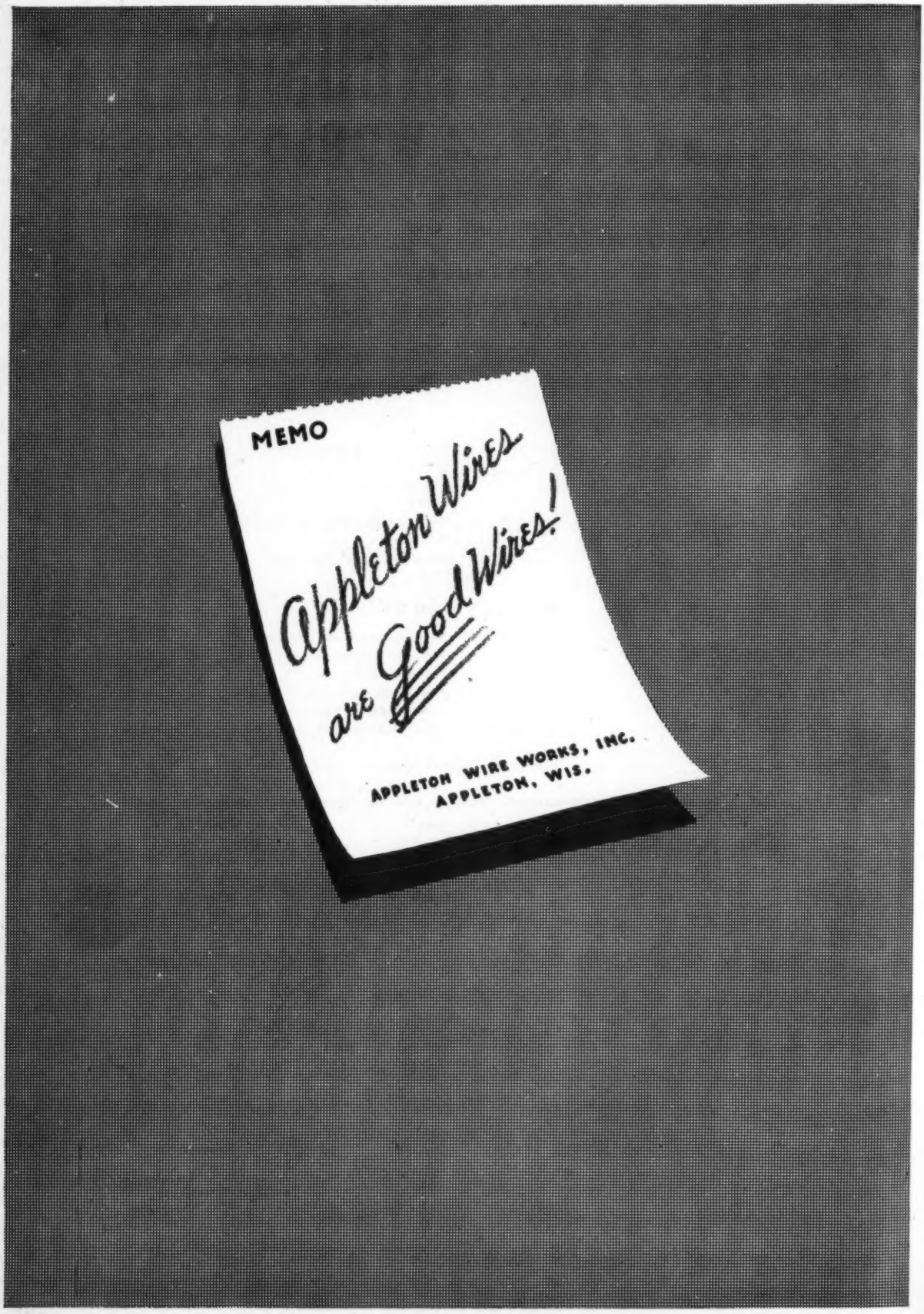
ADVERTISING REPRESENTATIVES

New York • RAYMOND S. VAN NYDECK • 9 Rockefeller Plaza • Circle 7-3085 • New York 20, N. Y.
Boston • MEADE AND COMPANY • 471 Statler Building • Liberty 9477 • Boston 16, Mass.
Cleveland • L. M. PERKINS • 3277 DeSoto Ave. • Yellowstone 6504 • Cleveland Heights 18, Ohio
Chicago • JOHN D. HENDERSON • 59 E. Van Buren Street • Wabash 3543 • Chicago 5, Illinois
Los Angeles • NOURSE ASSOCIATES • 412 West 6th Street • Vandike 5875 • Los Angeles 14, Calif.

THE PAPER INDUSTRY and PAPER WORLD is indexed regularly in "The Industrial Arts Index." An index to each volume is issued annually by the publisher as Section Two of the April number.
Copyright 1947 by Fritz Publications, Inc.

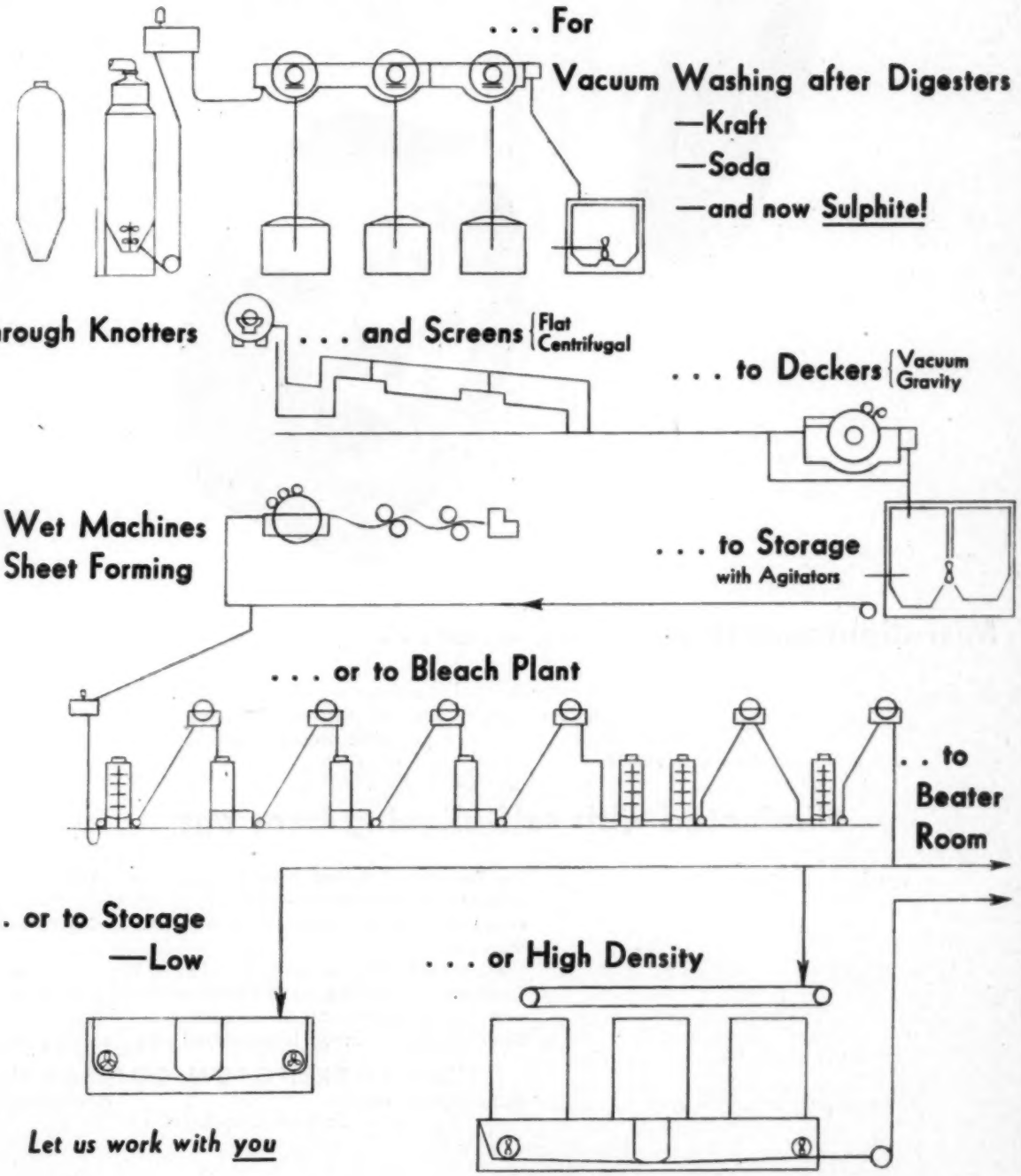
Member:
Audit Bureau of Circulation
Associated Business Papers, Inc.

Entered as second class matter June 29, 1938, at the post office at Chicago, Ill., under the Act of March 3, 1879. Subscriptions in the United States, U. S. Possessions, Canada, Cuba and Mexico, $2.00 for one year, $3.00 for two years. All other countries $3.00 for one year, $5.00 for two years.


MEMO
Appleton Wires are Good Wires!
APPLETON WIRE WORKS, INC.
APPLETON, WIS.

Improved Pulp Mill Equipment

"FROM COOKING TO USE"



Let us work with you

***Improved* PAPER MACHINERY CORPORATION**

NASHUA · NEW HAMPSHIRE

Mis-alignment that causes wear . . .

can happen in bearings just as it occurs in an automobile tire when the wheel is "out-of-line." Rapid wear, friction, and stresses caused by mis-alignment can result in premature bearing failure. These factors can be

Eliminated with self-aligning bearings

The Torrington *Spherical* Roller Bearing is self-aligning. Any mis-alignment due to shaft deflection, lack of rigidity or other cause is compensated by the bearing itself—without lessening its radial or thrust capacity.

This unique feature of the *Spherical* Roller Bearing is responsible for its rapidly increasing use. If you do not have a copy of our Technical Bulletin #200 on this newest addition to the line of Torrington Bearings, a request on your letterhead will bring you a copy promptly.

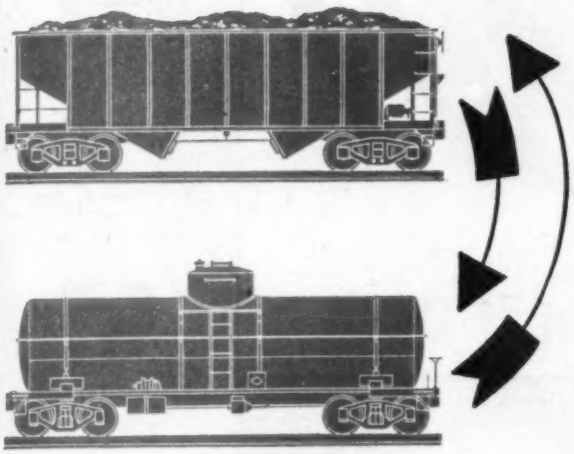
THE TORRINGTON COMPANY

SOUTH BEND 21, INDIANA TORRINGTON, CONN.

Offices in All Principal Cities

TORRINGTON BEARINGS

• NEEDLE • SPHERICAL ROLLER • STRAIGHT ROLLER • TAPERED ROLLER • BALL •



changing fuels IN YOUR POWER PLANT?

It's No Problem to users of ENCO OIL BURNERS with COAL FIRED UNITS

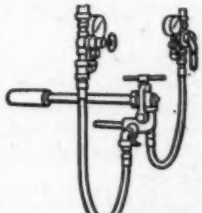
Coal—oil—or both if necessary; changing fuels is no problem if your power plant is equipped with ENCO Oil Burners in combination with coal burning units. Your operations need only be governed by availability of fuels and comparative BTU costs.

ENCO Burners, designed for use with or without air registers and for natural or forced draft, are made in various sizes with capacities from 10 to 1,000 gallons per hour. Mechanical and steam atomizers may be used interchangeably to provide a wide load range from cold starting to full load operation.

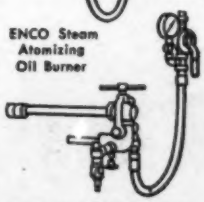
With Pulverized Coal Burners either ENCO Mechanical or Steam Atomizers are used for ignition and entire load range. Bulletin OB-PC, giving complete details on use of ENCO Oil Burners with pulverized coal will be sent on request.

from coal to oil and back to coal if necessary!

With Stoker or Hand-Fired Units, this same combination of oil burners with coal fired units can be used with either Steam or Mechanical Atomizer for partial or full loads. Complete information on either temporary or permanent installations of this type will be sent on request.



ENCO Steam Atomizing Oil Burner



ENCO Standard (Mechanical Atomizing) Oil Burner

BC-488

THE ENGINEER COMPANY
Also Produces
Enco Streamline Baffles
Enco Oil and Gas Burning Equipment
Enco Fuel Oil Pumping and Heating Units
Enco Automatic Combustion Control

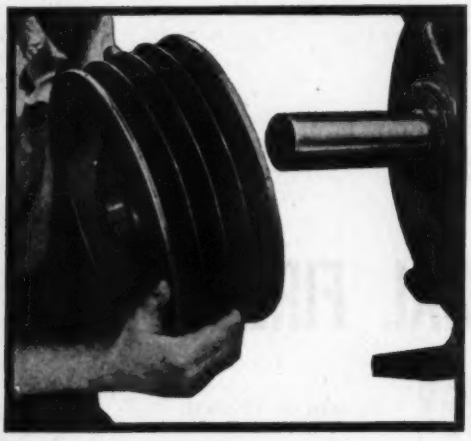
THE ENGINEER COMPANY

75 West Street, New York 6, N. Y.
Canadian Representative
F. J. Raskin Ltd., 370 Rachel E., Montreal, P. Q.

Easy-Mounting, Fast-Locking Sheave

Pays Off

The First Time You Put It On!



"MAGIC-GRIP" *sheaves offer time-saving, money-saving features!*

EVEN if you install the sheave only once, and never change it again — it pays to get a "Magic Grip" sheave! For frequent changes, naturally, your savings pyramid.

- No filing or reaming. "Magic-Grip" bushing slides easily, even on oversize shafts.
- No hammering or forcing to damage motor bearings.
- No wheel puller needed to get the sheave off.
- No set screws to mar or score the shaft.
- No wobble or blacklash. "Magic-Grip" sheaves lock to shaft with shrunk-on grip.

HOW DOES IT WORK? Sheave and bushing come completely assembled. You just slip it on the shaft — align — and tighten three screws. *That's all!* And it comes off just as easily.

Standardize on time-saving, money-saving "Magic-Grip" sheaves. They're heavy duty, precision made and finely finished — the best sheaves you can buy . . . the best economy in the long run. Get them through your nearest A-C dealer or office.

ALLIS-CHALMERS, MILWAUKEE 1, WIS.
A 2166

TEXROPE .. Greatest Name in V-Belt Drives

"Super 7" V-BELTS
Five Types — Sizes to suit every power transmission job.

Texsteel, Texdrive, "Magic-Grip"
— sheaves in a full range of sizes, grooves.

"Vari-Pitch" SHEAVES
Exact variations in speed, stationery or motion control.

SPEED CHANGERS
Speed variations up to 375% at the turn of a crank.

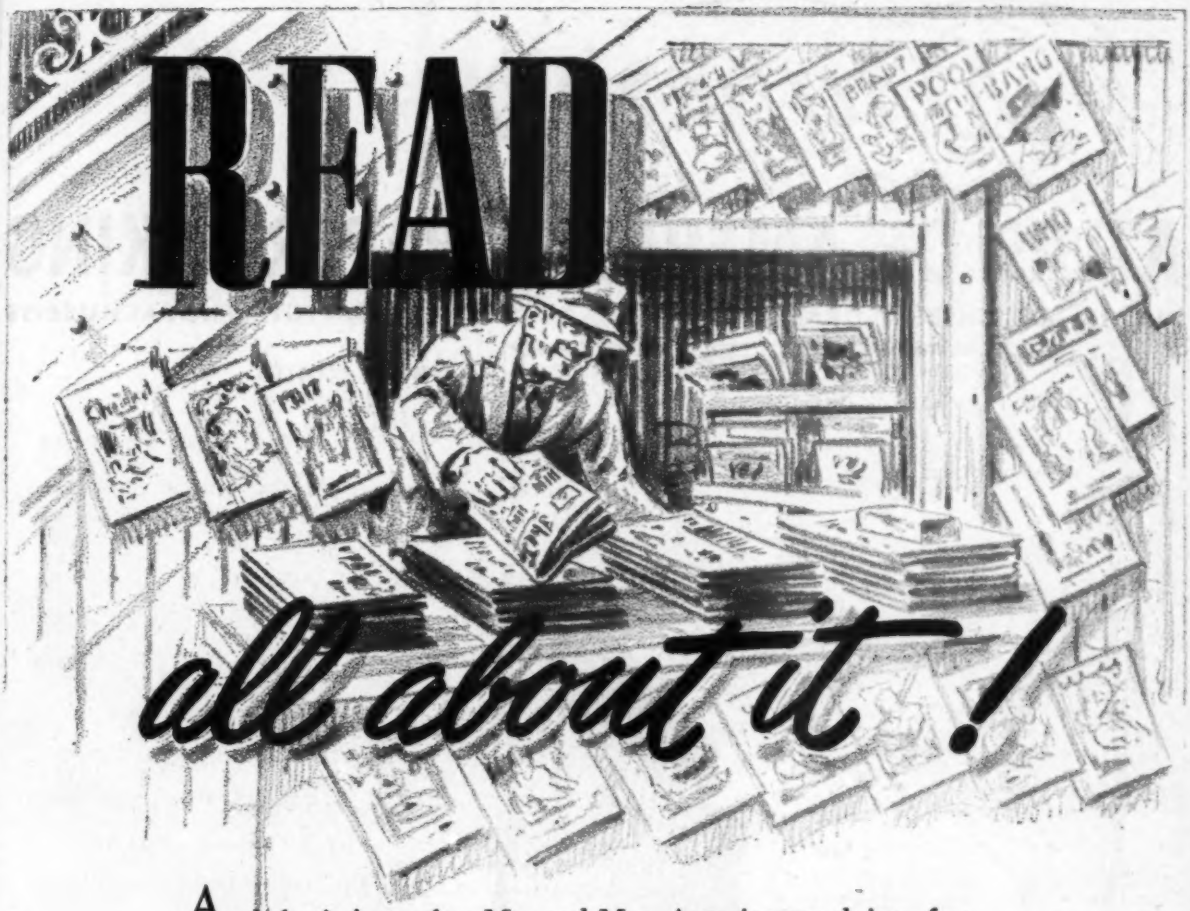
ENGINEERING
Finest V-Belt engineering talent in the world—at your call.

TEXROPE "Super 7" V-Belts result from the cooperative research of two great companies — Allis-Chalmers and B. F. Goodrich. They are sold only by A-C.

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment — Biggest of All in Range of Industrial Products

1847 1947
A CENTURY OF SERVICE to Industry THAT MADE America Great



And that's just what Mr. and Mrs. America are doing, for never has there been such a demand for magazines, newspapers, books, catalogs, and advertising matter. Paper manufacturers are continuing their splendid wartime efforts by running at full capacity to meet the record-breaking peacetime demand for paper and paper products.

The Pulp Division, Weyerhaeuser Timber Company, is supplied with pulpwood harvested from its extensive timber tracts operated on a sustained-yield basis. It can be depended upon to produce its share of pulp to help satisfy the industry's requirements—present and future.

WEYERHAEUSER

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 26 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS

Map copyright by L. D. Post, Inc., New York, N. Y. American Map Co., New York, N. Y.

HIGH LIGHTS:

Papermaking in Minnesota began shortly before the end of the "Gay Nineties." Today it stands 16th among the States in the annual production of paper, manufacturing in excess of 300,000 tons. With two exceptions, its mills are of the self-contained type, manufacturing pulp as well as paper, or paperboard.

The equipment includes 14 Fourdrinier machines, and 9 cylinders. The tonnage is fairly evenly divided between groundwood specialties, book paper, wrapping paper and various kinds of paperboard.

The pulp mill equipment includes 59 grinders, one sulphite, nine sulphate and four soda digestors, indicating a preponderant use of groundwood pulp.

Draper Felts for Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

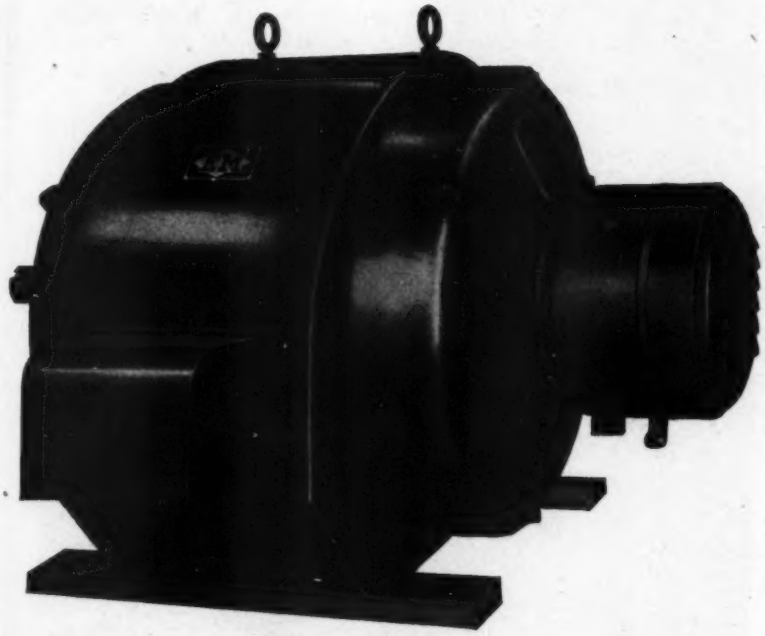
Canton, Massachusetts

RALPH E. BRIGGS, Sales Manager

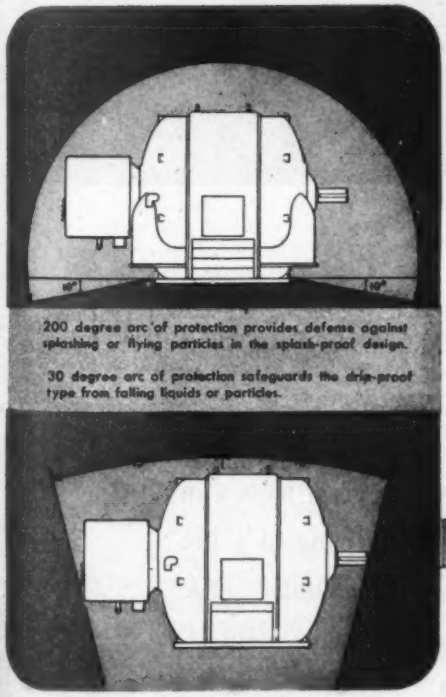
BRADFORD WEST, PITTSFIELD, MASS. — WILLIAM N. CONNOR, Jr., CANTON, MASS. — L. H. BREYFOGLE, KALAMAZOO, MICH. — L. L. GRIFFITHS, Jr., KALAMAZOO, MICH.

New Heavy-Duty Synchronous Motors

Advanced Design . . . Extra Protection



- **PROTECTION** from external damage . . . Drip-proof and splash-proof construction
- **SAFETY** against electrical breakdown . . . Solidly braced coils, extra tough insulation
- **STRENGTH** without excessive weight . . . Continuous welded steel plate frame
- **CONVENIENCE** of inspection and cleaning . . . Streamlined housing, ready accessibility



200 degree arc of protection provides defense against splashing or flying particles in the splash-proof design.

30 degree arc of protection safeguards the drip-proof type from falling liquids or particles.

MORE jobs can now have the advantages that make E-M Synchronous Motors "the most efficient drive in industry"... for the new Heavy-Duty line provides extra protection, assures most reliable operation in adverse locations.

Frame construction shuts out falling dirt and liquids, makes operation quieter. Smooth, rounded exterior invites easy cleaning. Brush inspection and blowing out is simplified with access plates designed for speedy removal.

Dependability increases with anti-friction or modern one-to-one ratio sleeve bearings in larger sizes and with anti-friction bearings in small sizes. All bearings can be cleaned and refilled without motor disassembly.

Add the new E-M protective features to the already recognized advantages of the synchronous motor—direct coupling, torque and kva requirements to fit the job, power factor correction and high efficiency—and you have the latest example of the specialized E-M engineering that provides the best in synchronous motors.

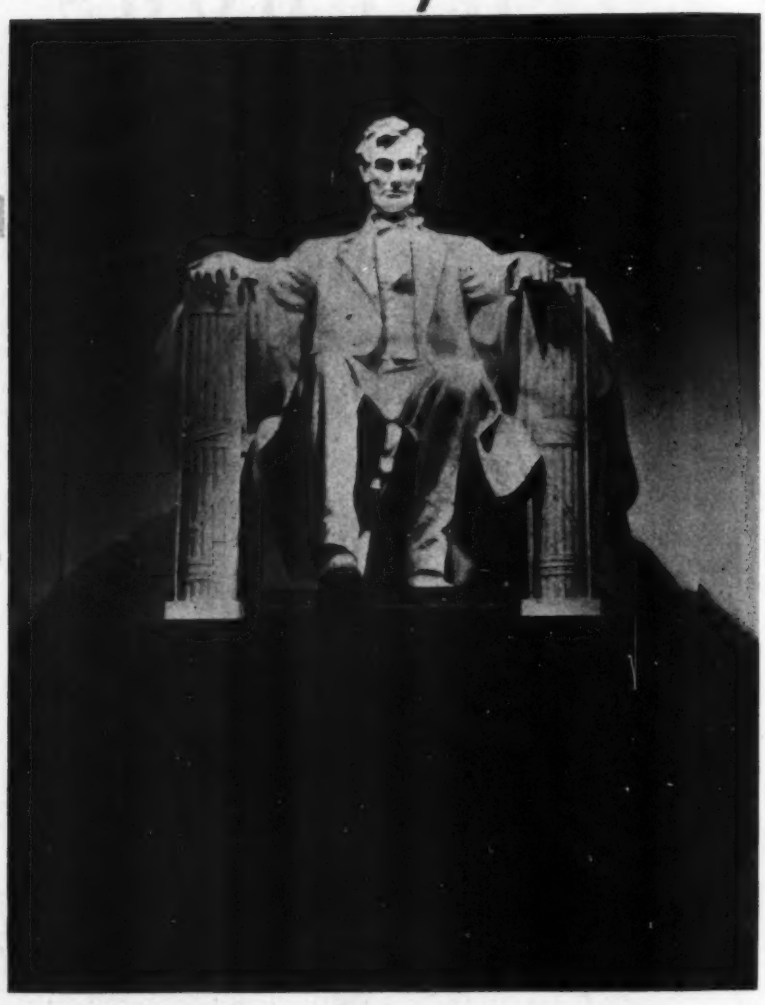
Your nearby E-M field engineer is the man to see for the best in synchronous motors.

ELECTRIC MACHINERY MFG. COMPANY

MINNEAPOLIS 13, MINNESOTA

Leaders in Synchronous Motor Development
The Most Efficient Drive in Industry

True Greatness



"Lives of great men all remind us
We can make our lives sublime,
And departing, leave behind us
Footprints on the sands of time."
—Longfellow.

Greatness is not a badge of honor; it may not be sought. Nor is any man borne to its heights by public acclaim or on rosy clouds of self-evaluation. The world has recognized many men as great soldiers, great financiers, or great leaders, but those men whose names have found a place in the annals of the *truly* great have won that esteem only through deep humility and the living of a life consecrated to the highest ideals of service to humanity. True greatness often has lived in complete obscurity.

TRADE WINDS

Bowater's Expansion Program Is Now Under Way

▶▶▶ DEVELOPMENTS OF THE greatest importance to the economy of Newfoundland are now progressing in the Corner Brook plant of Bowater's Newfoundland Pulp & Paper Mills, Ltd. The management expects that by June 1, 1948, the expansion program now going on in that plant will be completed, increasing the capacity of the mill to over 1,100 tons of pulp and paper a day, which is equivalent to an output of 350,000 tons a year. According to the company's statement, the completion of this expansion program will "make Corner Brook the largest integrated pulp and paper manufacturing unit in the world."

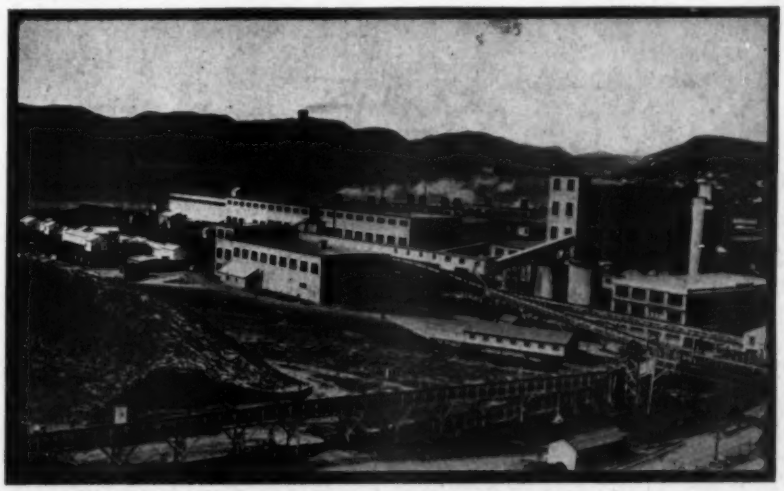
The main item in this plan is the new high-speed newsprint machine, which is being designed for an ultimate speed of 2,000 fpm and a trim width of 266 inches. This very high speed is not within reach at the present time, principally because of the fact that no headbox and slice have as yet been designed to meet such a speed. At first, therefore, the machine will run at 1,500 fpm, the speed being raised gradually to 1,750 as experience is gained in operation. The quoted capacity of 75,000 tons per annum is based on the initial speed of 1,500 fpm; every additional 100 feet of speed that can be obtained will increase the annual capacity by 5,000 tons.

The new machine, together with improvements to the company's five fourdrinier machines will increase the output of the plant 40 per cent. The existing newsprint machines consist of four 234-in. and one 120-in. The speed of the former is to be raised from the present 1,200 fpm to 1,250 fpm by the installation of new M.G. sets and double boxes on the couches, while the small machine is to be speeded up from 850 to 1,000 fpm by the substitution of a Harland electric drive for the present mechanical belt drive. The sulphite Flakt Dryer is also to be increased in capacity by the addition of four new dryer sections, raising its average daily tonnage from 130 to 175 tons. The sulphite machine and the large new fourdrinier should be completed before the present summer, but completion of work on the other machines is at present uncertain owing to the delay in delivery of electrical equipment.

The great increase in the mill capacity calls for alterations and extensions to almost every section of the mill. Of these, the more important are the installations of four new lines each of two Waterous super-type hydraulic magazine grinders, one new barking drum, and a complete extension to all phases of the screening system. In the power plant, two obsolescent boilers are being removed to make way for three new Foster Wheeler boilers, each with a capacity of 100,000 lb. per hour.

The cost of the alterations to the existing machines will be about $750,000 while capital expenditure on the new machine and on other parts of the expansion program will total about $7,000,000.

The plan calls for an annual cut by the Woods Department of 615,000



General view of the Corner Brook mill

The mill wharf

cords, of which 120,000 is required for export to one of the large English mills of the Bowater group. The proposed cut for delivery during this year is 450,000 cords—an increase of more than one-third will be required to meet the future demand.

It is estimated that this huge cut can be maintained permanently off the company's timber limits, which cover more than 11,000 square miles consisting of about 20 per cent freehold territory and the remainder on 99-year leases. The forest management policy of the company looks far into the future with a view to protecting what is to it the lifeblood of its business as well as being an important part of the heritage of Newfoundland. Detailed surveys undertaken by Bowater's substantiate the conclusion that conservation measures and a carefully planned policy of cutting will result in an increased annual harvest of wood in future years over that which is possible under existing conditions. The long-range program for expanding the scale of woods operations is designed not merely to obtain a greater cut at a more economical cost, but also to play its part in national development. The company's road building plans, calling for the construction of about 100 miles of new truck roads each year, will form valuable links in the government's future road development program.

The town of Corner Brook is located on the West coast of Newfoundland where the Humber River empties into the Bay of Islands. The port is icebound for three months of the year which makes storage facilities one of the major items in Bowater's planning program. During the open season, however, Corner Brook is a picturesque spot, frequented by those who seek fine fishing waters.

◆

▶▶▶ EIGHTY PER CENT of the stock of the Kenmore Mills, Jessup and Moore Paper Company's Elkton, Maryland, plant, has been purchased by the New York Post Corporation. The new ownership does not plan any personnel changes.

Loading pulpwood for trucking—50 tons are carried in each load

ST. REGIS OFFICIALS VISIT NEWLY-ACQUIRED MILLS

Business and industrial leaders in Kalamazoo, Mich., and Bucksport, Me., recently welcomed visiting officials of the St. Regis Paper Company and Time Inc. during an inspection tour of mills recently purchased by St. Regis in those cities.

In Kalamazoo, St. Regis has taken over ownership of the Bryant Paper Company, while in Bucksport it now owns the Maine Seaboard Paper Company, both formerly owned by Time Inc.

At a dinner on the evening of January 21, representative of business, industry, and the city government of Kalamazoo applauded Roy K. Ferguson, president of the St. Regis Paper Company, for his statement that the company would assume its full community responsibility instead of acting as an "absentee landlord."

Mr. Ferguson said that it was the aim of the company not only to make a highly important unit of the Bryant plant in the St. Regis organization, but also to "bring something permanent to Kalamazoo, to take part in the paper industry's life in the valley, and to recognize our responsibility not only to our employees and customers but to all phases of the community's life."

In Bucksport, Maine, officials of St. Regis revealed during their visit on January 14 that "ultimately a machine coater will be added at the mill which will make possible the production of high-grade coated paper." The Bucksport mill, main industry in the city of 3,000 population, is currently producing magazine paper in addition to newsprint. However, present plans call for almost complete discontinuance of newsprint production at Bucksport this year.

In addition to Mr. Ferguson, representatives of St. Regis who visited the two mills included: Lyman A. Beeman, vice president; Joseph A. Quinlan, vice president and traffic manager; William H. Versfelt, treasurer; Williard J. Dixon, vice president and secretary; Edward G. Murray, executive vice president of the St. Regis Sales Corporation; Kenneth D. Lozier, vice president of the sales corporation, and H. R. Lamb, St. Regis director and attorney. H. E. Machold, a St. Regis director, toured the Bucksport mill only.

Time Inc. was represented by Roy S. Larsen, president; Charles L. Stillman, vice president and treasurer, and Maurice T. Moore, chairman of the board, on both tours. Members of the Time Inc. board of directors joined the other officials for the Kalamazoo trip. (*See photographs page* 1540)

PAPER · · · America's 6th Industry

PAPER DRAPES FOR HOME DECORATION

(NEWS ITEM: *One manufacturer alone is producing 7,200,000 pairs of paper drapes a year.*)

Paper draperies have won a permanent place in many homes all over the country. Embossed with an imitation cloth weave, these paper drapes decorate windows as artistically as expensive fabrics—at a fraction of the cost. Housewives acclaim their durability and strength, made possible by special treatment. Fade-proof, flame-resistant, paper curtains are also unaffected by grease or water. They can be cleaned with a damp cloth. We will gladly supply manufacturers' names if this product is not available at your neighborhood store.

Paper bags for vacuum cleaners . . . paper cans for frozen foods . . . paper tissues for auto windshields . . . new uses for paper calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities—new opportunities for the Pulp and Paper Industry.

The Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines.

Among the new machines under construction by Puseyjones are three of the largest and fastest Fourdrinier Machines, one for white paper for bags, one for Kraft liner board, and one for Kraft paper for multi-wall bags; also one Cylinder machine of record size and speed for the manufacture of floor covering felt. Other machines are under construction for the manufacture of M. G. Kraft specialties, facial tissues, and high grade bristols.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

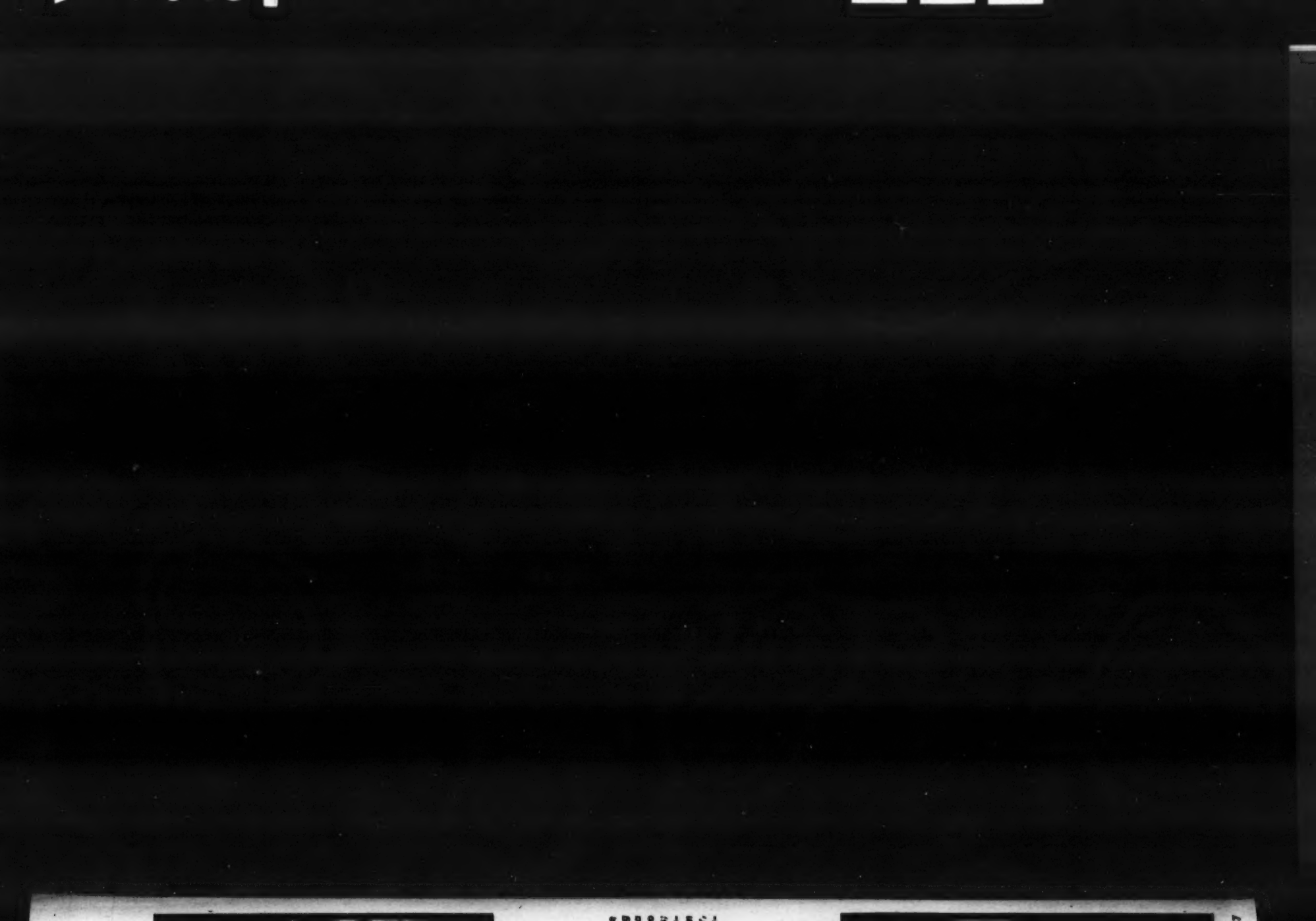
Group of St. Regis and Time Officials Visit Kalamazoo

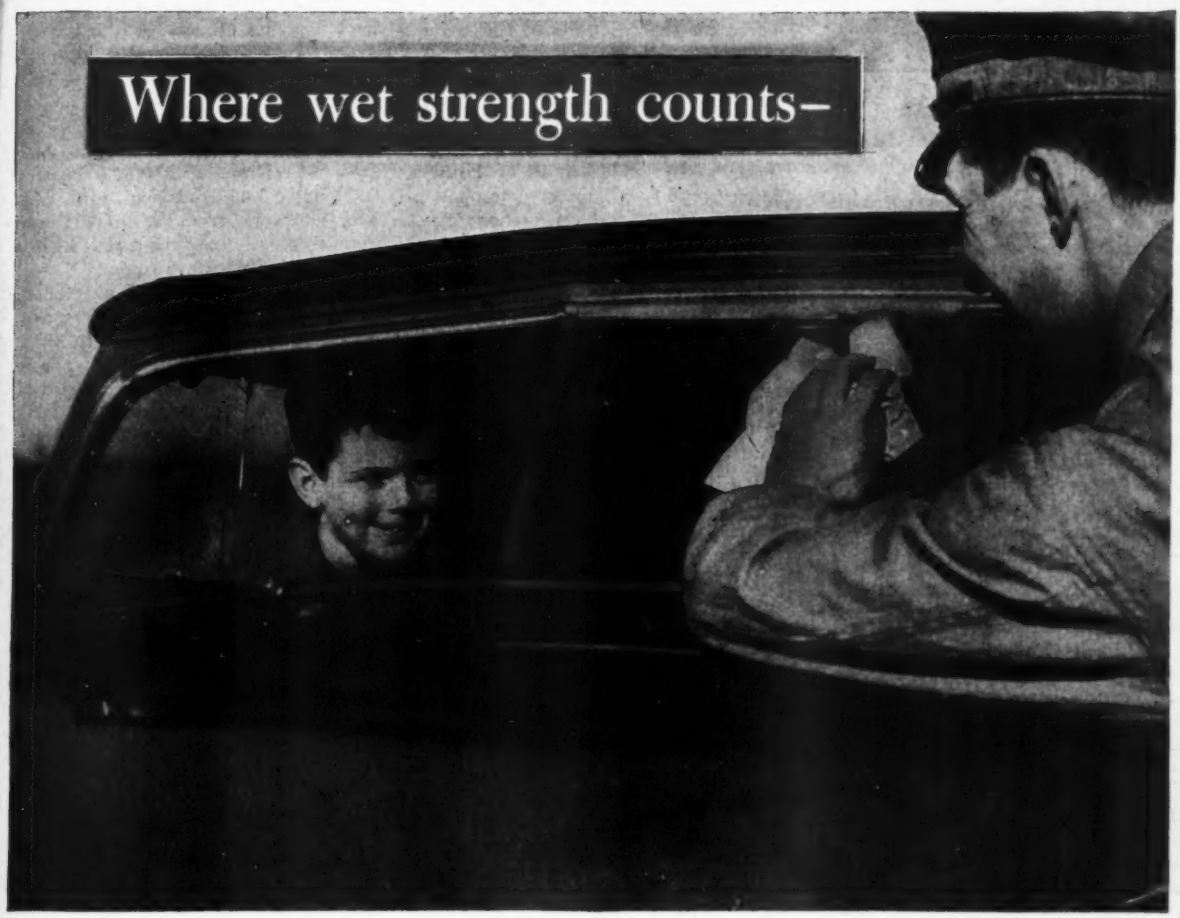
When a delegation of officials representing the St. Regis Paper Company and Time Inc. visited Kalamazoo, Michigan, on January 21, they were met with a real welcome. The St. Regis Paper Company recently acquired the Bryant Paper Company in Kalamazoo from Time Inc. (Cf. P.I. and P.W. Oct., 1946). Industrial and business leaders of Kalamazoo, under the direction of a committee headed by L. W. Sutherland and R. A. Hayward, arranged a dinner for the visitors at the Park Club. In the picture at the right (taken during the dinner) are: (L to R) In the foreground—Horace Lamb, general counsel and director, St. Regis; George K. Ferguson, president and chairman of the board, Watervliet Paper Company; and William Griffin, director, Time. In the background

—Lyman Beeman, vice president St. Regis; Charles L. Stillman, vice president and treasurer of Time; Atty. Marvin J. Schaberg, toastmaster; Roy K. Ferguson, president St. Regis; L. W. Sutherland, presiding, and Roy E. Larson, president of Time

At the left Mr. Ferguson is shown as he inspects the Imperial Division coating mill of the Bryant plant and watches a coated paper sorter at work. Left to right: W. H. Versfelt, treasurer St. Regis; W. J. Dixon, vice president and secretary; William Brower, finishing room foreman; Roy K. Ferguson; K. D. Lizier, vice president St. Regis Sales Corporation, and Dorothy Wagner, sorter

In the Imperial Division, Mr. Ferguson is shown (at right) watching operations at the wet end of the new No. 15 double coater. Explaining details of the installation to the St. Regis president is Kenneth Matveia (at left), superintendent of the division and one of the group charged with getting the big new machine in operation. Facing Mr. Ferguson are: John Collins, electrician (wearing cap), who did much of the electrical work on the new machine, and Anthony Locker, wet end machine tender





–count on UFORMITES 467 and 470 to do the job easily and at low cost!

LOOKING for a simple, effective way to increase wet strength of paper towels, bag paper, or specialty papers?

If you're working with Kraft, just add UFORMITE 467 at the beater.

Or for sulfite, rag and groundwood—for all papers where low acidity is essential—use UFORMITE 470.

No changes are needed in your production procedure . . . no special equipment required . . . no pretreatment or aging of these urea formaldehyde resins.

As little as 1% resin solids on dry fibre weight boosts wet strength by as much as 300%. Dry tensile, Mullen, fold, uniformity of sizing and surface-coating characteristics are materially improved at the same time.

Write for the full facts on the UFORMITES!

UFORMITE *is a trade-mark, Reg. U. S. Pat. Off.*

Represented by Cia. Rohm y Haas, S.R.L., Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities

THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Washington

SPEAKERS FOR THE PAPER INDUSTRY APPEAR BEFORE RECIPROCITY INFO. COMM.

▶▶▶ The over-all question of reciprocity through Reciprocal Trade Agreements has become a political issue at Washington, and the month of January recorded the most complete hearing on the general question of tariffs in Washington history. The Administration is standing firm on its proposals to carry through tariff-reducing negotiations with eighteen nations, but there has been an outburst from some quarters against the program. Opposition has ranged from outright proposals to cancel all the pending program to more moderate suggestions that attention be given to a study and modification of the tariff reducing procedure as it is now conducted by the State Department.

Inasmuch as the Republican party platform has approved the principle of reciprocal trade on tariff rates, and because of the fear that cancellation of the program may react adversely to this country's program for international harmony, it is a reasonably safe guess that the program will not be canceled. Because of the violent protests, however, it is also reasonably certain that American industry will be given careful consideration when the time comes for actual negotiations. Chairman Edminster of the Committee for Reciprocity Information has categorically stated that "industry will not be thrown to the wolves."

Following the filing of briefs by a large number of industries on December 21, some 800 witnesses were scheduled to appear before the Committee for Reciprocity Information and its five panels during January.

Two days were given to the paper industry, and appearances were made by Cola G. Parker for the American Paper and Pulp Association; George Olmsted, Jr., for the Book Paper Manufacturers Association; R. E. Canfield for the Ground Wood Paper Manufacturers Association; Francis C. Heywood for the Coated and Processed Paper Association; Edgar P. Eaton for the Paper Stationery and Tablet Manufacturing Association; W. L. Carver for the Wall Paper Institute; Henry D. Schmidt and George B. Gibson for the National Paperboard Association, and Campbell Bosson for the National Leather Fibre Conference. [*See article this issue "Statements Relative to Reciprocal Trade Agreements," for remarks made by Messrs. Parker, Olmsted, and Canfield.*]

There were no arguments from any source for the reduction of duties on any grades or products of paper. J. Griffen McKiernan, counsel for the International Brotherhood of Paper Makers appeared in complete support of the position of the paper manufacturers. Harry H. Straus, of Ecusta Paper Corporation, appeared to oppose any reduction of the duty on cigarette paper.

◆

BRITISH PAPER NOTES (December, 1946)

Historians reviewing the year 1946 in the British paper trade will find this period most outstanding. Never has the industry heard so many warnings or so many prophecies of trouble in store from so many people. As a final note punctuating the story of slow restoration and continued industrial frustration, Anthony Eden recently warned a political recruiting rally that Britain was "caught in a vicious ring of shortages."

Within the ring of shortages, Mr. Eden included papermaking materials, and this condition affecting the paper trade was confirmed by Sir Keith Price, retiring president of the British Wood Pulp Association, when he expressed hope that raw material supplies from Sweden, Norway, and Finland would increase, but he expressed fear that that future supplies from Scandinavia would be inadequate to meet Britain's needs. He looked to Canada, Newfoundland, and the United States to provide sources of future supply. Although resources in these countries are lower than at the peak of wartime production, he was hopeful that this was only a temporary condition.

Sir Keith Price's opinion added to the recently presented opinion of the president of the Paper Makers Association leads one to speculate that the pulp producing center of the world may be shifting from Scandinavia to North America. All evidence points to this conclusion since production limits were reached in Scandinavian countries even before the war, and since demands for wood pulp have extended beyond the requirements of the papermaking industry, it can be assumed that fresh forest lands will have to be cut rather than causing a depletion of existing stocks in Scandinavia beyond the rate of reforestation.

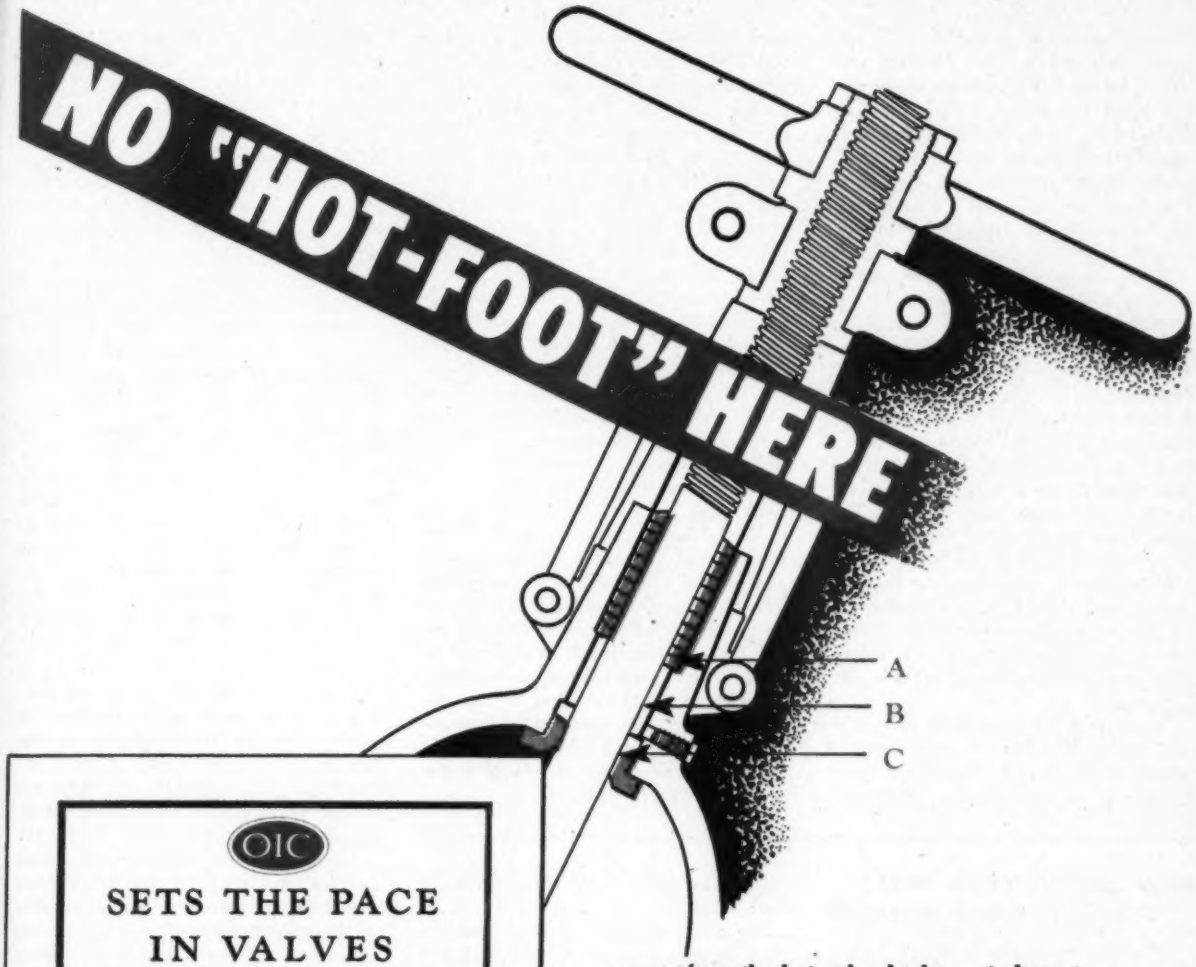
Board of Trade returns indicate further confirmation of pulp shortages each month. The returns covering October report imports of 79,291 tons which is not much higher than importations for October, 1945. These figures are paled by the reports of imports of 1,636,530 tons for the same month in 1938. Comparing the ten-month period of 1938 with that of 1946, imports of chemical wood pulp totaled 596,100 tons for 1938, and 454,894 tons for 1946; mechanical wood pulp totaled 552,200 tons for 1938, and 216,682 tons for 1946; esparto grass totaled 259,682 tons for 1938 and 93,089 tons for 1946. Materials imported from the United States totaled 9,687 tons compared with a prewar total of 28,930 tons.

Imports of paper and paperboard reflect a similar state of affairs over the same ten-month period. In 1938, 892,255 tons were imported, while in 1946, 245,779 tons were imported. All efforts of the British paper trade to reach an export level of 150 per cent of its prewar schedule has fallen short of its goal. Tonnage exported in 1946 reached 92,687 tons. In 1938, 147,034 tons were exported. This year's percentage average reached only 63 per cent of the expected figure.

Encouragement is gained in spite of the reported figures for imported papermaking materials, when one reads in the government *Monthly Digest of Statistics* that stocks of materials in Britain and imported by Britain showed a sharp rise during the most recent months surveyed, August and September. In August, the total of pulpwood, including wood waste and chippings, was 23,000 tons; this total rose to 41,000 tons in September. Similarly, esparto grass stocks rose from 29,000 tons to 34,400 tons between the two months. Rags, waste, and rope were steady during both August and September at stocks of 36,400 tons reported. Waste paper stocks were level at 79,600 tons for the two months. Straw declined from 8,300 to 7,400 tons. Wood pulp for papermaking, including cellulose wadding, decreased 10,000 tons in August and 219,000 tons in September.

An ingenuous method for sparking attention to the shortage of papermaking raw material has been suggested by the Wall Paper Manufacturers, Limited. Appealing to housewife morale which is negatively affected by dingy wall paper and wall decorations, production drives are emphasized as a means of obtaining raw material. Such drives are sheer mockery in the industry—given the necessary raw materials and the necessary paper, such drives would operate automatically.

Despite the difficulties in the present shortage situation, relief is found in the annual financial reports of the paper mills which indicate a generally healthy condition with expansion movements under way. Wiggins, Teape and Company (1919) Limited, have sponsored a new stock issue to be used in financing expansion of its sub-

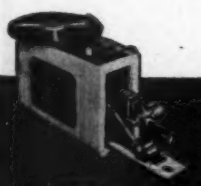


OIC

SETS THE PACE IN VALVES

MANY a steel valve has been quickly ruined by high-temperature fluids or gases near the foot of the stuffing-box. Heat can literally "bake" the packing to the stem and the stuffing box . . . causing galling and seizing. Now OIC valve designers have solved this problem by lifting the foot of the stuffing box farther away from the hot valve body . . . to keep the packing cool and in good condition.

As you can see in the picture above, this efficient, new OIC steel valve design is as simple as A, B, C. Packing is separated from the hot valve body by a heavy, alloy-steel ring bushing (A) . . . a condensing chamber (B) . . . and a pressure-tight back-seat bushing (C). The packing stays cool . . . stays on the job to assure you long, economical, trouble-free valve service.



See new film

For latest information on steel valves, see the new OIC sound slidefilm. If you'd like a "showing" for your personnel, please mail reservation request now to The Ohio Injector Company—Wadsworth, Ohio.

O-147-S

OIC VALVES

STEEL - IRON - BRONZE

sidiary companies, Bridgend and Ford Paper Mills and William Howard and Son, Limited. The former company will build a new mill at Llynfi, near Bridgend in South Wales, which will manufacture tissues in the past imported from Austria and Germany. The Ford mill will install a new twin wire machine for the production of esparto and wood papers.

Since the position of paper supply remains a shortage, publishers are encountering difficulties in launching new publications under the limitations established by Paper Control Order Number 70. This regulation allows publishers to use only 8 cwt. of paper during each license period. A deputation to the Board of Trade has been unsuccessful in winning greater allowances for new publications. The refusal was based upon the fact that allotments to prewar publishers are on a 40 per cent quota of prewar requirements, and should greater allotments be granted to new publications in face of the continuing shortage, the established publications would suffer a cut in quota.

Suggestion has been made that lifting Order Number 70 may cause a breach in the British magazine market by American publications. Moreover, some British journals are showing startling originality in color presentations, especially in the field of women's interest journals. The expanding field of color printing is important to all sides of the paper industry, and when free and real competition returns, color printing will govern the papermaking trade. The British have never been purchasers of quantity but have followed the quality line. Hence, color presentation will direct the purchase of quality publications; and it is doubtful that a sixty-four page daily will have a large buying market in Britain. Also, since limitations in the size of daily publications have been made expedient, it is doubtful if the British readers will ever desire a return to the twenty or thirty page daily paper.

With these facts in mind, the stepping up of newsprint production in any part of the world is of more than casual interest. Australia reports an ambitious program in raising newsprint production from 30,000 tons to 70,000 tons annually indicating that country is on its way out of the export market. The production of newsprint is not alone of interest, but the production of better classes of paper is also of general concern.

NEW ORGANIZATION WILL STIMULATE WOOD RESEARCH

The Forest Products Research Society—designed to meet the need for a national association devoted entirely to stimulating wood research, development, utilization and production—has been organized, effective February 1, following a meeting held at Madison, Wisconsin, of industrial, educational, and government forest products technologists.

National officers elected to head the new society in its first year included Fred W. Gottschalk, Chicago, Ill. (technical director, American Lumber and Treating Co.), president; George A. Garratt, New Haven, Conn. (dean, School of Forestry, Yale University), vice president; William J. Baker, Madison, Wis. (technologist, U. S. Forest Products Laboratory), secretary-treasurer; and Bror L. Grondal, Seattle, Wash. (professor of forestry, University of Washington), past organizational chairman.

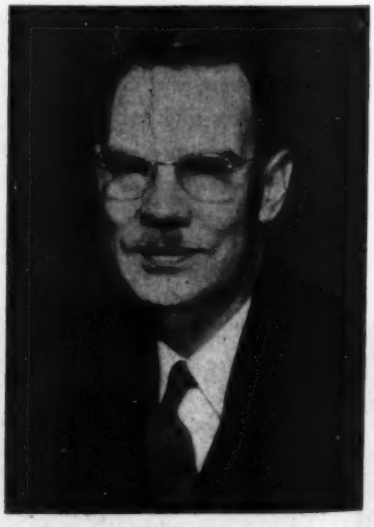
Membership in the society is open to men who are engaged or interested in any phase of forest products activity. This representative cross-section of the wood industry, including both the highly-specialized technician and the supervisory shop man, will provide a common meeting ground for theory and practice and encourage quicker application of laboratory findings to industrial operations, officers point out.

It is recognized by founders of the new organization that a man working in one division of the wood industry is often finding answers to problems that are causing misuse of wood in production plants or even ruling the material out for certain uses. Getting this basic information to the men who make or use products stemming from the forest is among the Society's primary services.

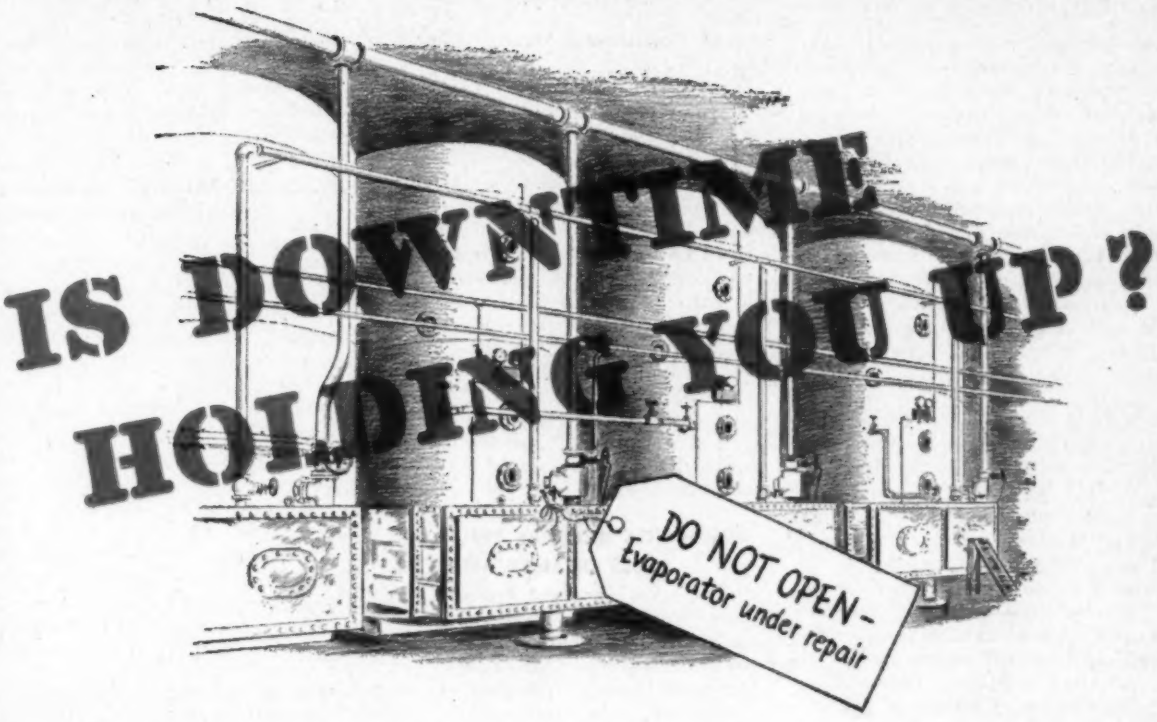
Formally stated objectives and purposes, as set forth in the articles of association, are "to facilitate the interchange of information among individuals and organizations who are interested in forest products research, development, or utilization (a) by abstracting papers, reports, and other publications, (b) by publishing and distributing pertinent information, (c) by encouraging co-operation among interested persons, (d) by promoting standard tests methods and procedures, (e) by sponsoring meetings for the presentation and discussion of reports of investigations and experiences of its members and others, for the interchange of ideas, and the broadening of acquaintanceships among individ-

Fred W. Gottschalk

George A. Garratt



William J. Baker



BECAUSE they last, on an average, 3 times longer, Timken evaporator tubes of 5% nickel steel drastically reduce expensive downtime.

For the more concentrated effects in black liquor evaporator service, a recent survey showed that Timken 5% nickel steel averages 300% more service than carbon steels. In addition, these fine alloy steel seamless tubes assure longer service from the tube sheets themselves.

Thus, replacement costs are cut considerably at the same time that evaporator downtime losses are reduced.

Nowhere else can you find the combination of experience in high temperature applications, choice of steels and assurance of quality that The Timken Roller Bearing Company offers.

Why not let a member of our Technical Staff make specific recommendations for your application? Steel and Tube Division, The Timken Roller Bearing Company, Canton 6, Ohio.

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

uals interested in forest products research, development, or utilization; and in general, to encourage and promote the efficient utilization of wood and other forest products."

The Society, while national in scope, will comprise six regions. These, in turn, will be composed of autonomous sections, composed of 10 or more members residing in the same area. The six regions designated are as follows:

Northeast — Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and adjacent Canada.

Southeast—Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia.

North-Central — Illinois, Indiana, Iowa, Minnesota, Nebraska, North Dakota, Michigan, Ohio, South Dakota, Wisconsin, and adjacent Canada.

South-Central—Alabama, Arkansas, Kentucky, Louisiana, Mississippi, Missouri, Oklahoma, Tennessee, and Texas.

Northwest—Alaska, Idaho, Montana, Oregon, Washington and adjacent Canada.

Southwest — Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming.

The address of the secretary-treasurer of the Forest Products Research Society is P. O. Box 2088, University Station, Madison 5, Wisconsin.

◆

CHINESE INVITE FORESTRY COLLEGE PROFESSORS TO BE HONORARY ADVISORS

The Ministry of Agriculture and Forestry of China has invited Professors Nelson C. Brown and Edward F. McCarthy of The New York State College of Forestry, Syracuse University, to be honorary advisors on wood products and silviculture, respectively, to the National Bureau of Forest Research, Nanking, China. The invitation was in Chinese on a large sheet of parchment. The letters of transmittal were in English, written by Han Ngan, Director of the Bureau of Research, a classmate of Professor McCarthy's, Forestry School, University of Michigan, 1911.

Han Ngan states: "We now have six technical divisions: Silviculture, Extension Soil and Water Conservation, Wood Technology, Forest Products, and Forest Economics. There are also four forest experimental stations under the Research Bureau, namely, the Central China Forest Experimental Station (Nanking), North China Forest Experimental Station (Peking), the South China Forest Experimental Station (Hai Nan Island, south of Kuangtung), and Southwest China Forest Experimental Station (Chungking)."

Mr. Ngan also writes, "Reforestation and soil conservation are two important phases of work under the Bureau of Research, but in view of the size of the country and the difficulty of transportation, progress has been slow. Recently we have applied to the UNRRA for a supply of tree seeds of the leading American species for trial in different parts of China. We shall be glad to exchange tree seeds with any institute or person in the States.

"Work in wood technology and forest products is more difficult with us due to the lack of equipment and experienced personnel, but we feel we are making good progress and prospects are bright."

◆

DESIDERIOS ACQUIRE TWO MILLS OF McEWAN BROS.

The seven Desiderio Brothers who have jointly owned three paperboard mills, have just added two more mills to their holdings. On January 22, Anthony Desiderio, president of each of the organizations, negotiated for the purchase of two mills from McEwan Brothers, Incorporated, Whippany, New Jersey. The Desiderios also own another Whippany plant, that of the Whippany Paperboard Company, formerly owned by U. S. Paperboard Company.

Although the amount of the transaction was not announced, it is said the deal was one of the largest single sales ever recorded in the Whippany area—it is believed by some that the amount would run well into seven figures.

Other mills owned by the Desiderios are: the Clifton Paper Board Company, Clifton, New Jersey; and the Durham Paper Board Company, Durham, Pennsylvania.

◆

OFFICERS RE-ELECTED AT MARATHON ANNUAL MEETING

Stockholders and directors of the Marathon Corporation, Rothschild, Wisconsin, met January 18. The directors and officers of the corporation were re-elected, and a regular quarterly dividend of twenty-five cents per share was voted by the directors payable on February 20 to those shareholders of record at the end of business on January 31.

During 1946, 400,000 shares of common stock outstanding at the beginning of the fiscal year was split on a two-for-one basis and a dividend of 10 per cent declared which brought the total issue to 880,000 shares. The sale of 420,000 shares brought the total stock outstanding to 1,300,000 shares. From the proceeds derived from the sale of stock, $10,000,000 of funded debt was retired, and funds provided for the completion of the Canadian pulp mill and other construction.

◆

MOORE BOXES, INC., ACQUIRED BY NATIONAL CONTAINER

Purchase of all stock in Moore Boxes, Incorporated, Chicago, has been announced by Samuel Kipnis, president of National Container Corporation, Jacksonville, Florida. Acquisition of the Moore organization, which now becomes one of National Container's subsidiaries, was effected January 1. Leonard T. Moore will continue as vice president and general manager of the new National division.

The parent company now owns and operates four kraft pulp and board mills and five corrugated paper container converting plants in Florida, Virginia, New York, Pennsylvania, Michigan, Wisconsin, and California.

◆

STRAW HANDLING PROBLEMS FORM TOPIC OF CONFERENCE HELD AT PEORIA LABORATORY

A conference held January 13 at the Northern Regional Research Laboratory in Peoria, Illinois, was attended by representatives of farm machine and pulp and paper plants who conferred with agricultural engineers of midwestern agricultural colleges and technicians of the Laboratory.

The subject of panel of the conference was "Straw Collection and Baling." In discussing the problems of the farmer, machinery manufacturer and pulp and paper manufacturers, the general opinion resulted that the present one-man farm baler does not give a package compact enough as to weight per unit of volume for most efficient and economical handling in the pulp and paper industry.

Dr. S. I. Aronovsky, in charge of the pulp and paper section, agricultural residues division of the Laboratory, stated that the conference had come about after several years of research by members of the Laboratory staff and representatives of the strawboard industry. Dr. Aronovsky was chairman of the meeting.

E. C. Lathrop, head of the agricultural residues division of the Laboratory, spoke on the "Economics of Straw Utilization." The subject "Collection and Quality of Straw for the Strawboard Industry," was covered by Dr. Aronovsky.

Further study will be given this subject through committees to be appointed by farm implement makers and strawboard manufacturers.

ARE YOU INTERESTED IN
HIGHER YIELDS TO SAVE WOOD
AND TO LOWER YOUR COSTS? IF SO

Continuous

BEATING AND REFINING

by

SUTHERLAND

CAN DEFINITELY HELP
YOU ACCOMPLISH BOTH

SUTHERLAND REFINER CORPORATION
TRENTON, NEW JERSEY · *Manufactured in the United States by Valley Iron Works Co., Appleton, Wis.*

SUTHERLAND REFINER LIMITED, 319 DRUMMOND BLDG., MONTREAL, P.Q., *Manufactured in Canada By The John Bertram & Sons Co. Ltd., Dundas, Ontario*

HINDE & DAUCH TO IMPROVE BOX FACTORY IN BUFFALO

An expansion project which will cost an estimated $400,000 is announced by Hinde & Dauch Paper Company, Sandusky, Ohio. The company's factory in Buffalo, New York, has been selected for this expansion which the company believes will meet an anticipated future demand for its products.

Hinde & Dauch company has operated the Buffalo plant since 1930, at which time it acquired the facilities of the Buffalo Box Factory. A site adjacent to the present plant has been acquired for the new project and construction is already under way. Sidney Frohman, president of the company, states that the purchase of new machinery will represent a considerable portion of the expansion cost. The plans include a modern new office and a well-equipped package laboratory.

◆

PAPER TECHNOLOGY CLASS VISITS RIEGEL CO. PLANT

The class in Pulp and Paper Technology at the Polytechnic Institute of Brooklyn, New York, made up of paper and pulp mill technical and sales personnel who attend evening lectures, visited the Riegel Paper Company's Milford, New Jersey, mill in January.

Thirty members of the student group lead by Professor Robert S. Aries inspected the mill equipment and familiarized themselves with the techniques used in the manufacture of glassine and greaseproof papers, as well as coating and printing processes used at the mill.

During the spring term, the class will visit both northern and southern mills. The second term of the course, dealing principally with paper, paper specialties, paperboard, and combinations of plastics and paper is open to qualified men from the industry. The meeting time for the class will be Thursday nights, 6:00 to 8:00 p. m. at the Eagle Building, Borough Hall, Brooklyn.

◆

▶▶▶ THE FORMATION of a new sales district in its multiwall bag division was announced by St. Regis Paper Company, New York, and became effective February 1. For the present, the district will cover the state of Pennsylvania, with the exception of the city of Philadelphia. Headquarters will be in Allentown (Pa.) under the supervision of Burton A. Ford, vice president of St. Regis Sales Corporation.

◆

▶▶▶ ANOTHER STATE entered the nation-wide Tree Farm Program in December when five timberland owners of South Carolina were certified as Tree Farmers. For some time a large number of South Carolina woodland owners and forestry officials have adhered to the approved methods of tree farming without actually joining the National Tree Farm movement. The state checks in as number sixteen on the list of tree farming states.

◆

H&W PIONEER IN MODERN COMFORTABLE HOUSING UNITS FOR WOODSMEN

Logging camps are always on the move—following the woodsmen to new fields of operation. And because of this, temporary and pretty rough housing units are usually erected.

Now, Hollingsworth & Whitney (head office, Boston; mills in Madison and Winslow, Maine, and Mobile, Alabama) have made provision for comforts, previously *unknown* in northeastern logging camps, through the construction of portable units. Their new camp buildings provide such modern accommodations as are usually found only in towns and cities.

A 10-kw. electric generator furnishes current for lights in all buildings and camp yards, plus the operation of power tools. Hot and cold running water is available in each housing unit and in the kitchen. A separate laundry and shower room is equipped with set-tubs and shower stalls. And a sanitary, heated latrine is an additional unusual feature.

The sleeping quarters offer modern, individual accommodations. Army type double-deck bunks, equipped with mattresses, clean blankets and pillows, provide sleeping comforts not usually found on woods operations. A maximum of 32 men occupy each such building.

The combined cookhouse and dining room is planned for efficient storage, preparation and serving of the best food obtainable. Each dining table seats eight men comfortably.

Provision has been made for employees to work with maximum efficiency. The repair and maintenance garages have proper lighting and adequate storage for tools and equipment. The saw filers quarters, located in the building housing the electric generator, have broad windows and ample work benches.

Hollingsworth & Whitney now have in operation four of these portable units. Designed to meet the needs of logging operations in the northeastern area, these camps are the last word in modern, comfortable, convenient woodsmen's housing. As planned by the engineering firm of Fay, Spofford & Thorndike, of Boston, these buildings can be taken down and re-erected by a few men at a new site on any arrangement which may suit the needs of the location.

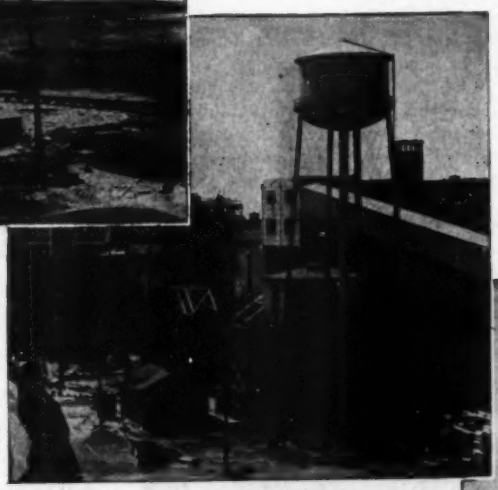
Hollingsworth & Whitney's new logging camps have comfortable sleeping quarters (right) with combined cookhouse and dining room (left)

HORTON ELEVATED STORAGE provides a 3-Way SERVICE

. . . at a Sulphite Pulp Mill

Horton elevated water storage tanks are used by the paper industry for several distinct types of service. The photos on this page show three such structures at a sulphite pulp mill in Florida. They are used for three different services—the one at the left for fire protection; the one below for general service; and the one at the lower right is used at the water treating plant.

Above: **HORTON ELEVATED TANK FOR FIRE PROTECTION** *The Horton elevated tank shown above is used to provide a reserve of water for fire protection. It holds 100,000 gals. and is 150 ft. to bottom.*



Left: **HORTON ELEVATED TANK FOR GENERAL SERVICE** *This Horton elevated tank provides gravity pressure on the treated water supply for the various processes at the mill. It holds 100,000 gals. and is 100 ft. to bottom.*

Right: **HORTON ELEVATED TANK FOR USE AT WATER TREATING PLANT** *This 100,000-gal. Horton tank is used to store sea water taken from a nearby tidal river. The tank floats on the sea water line behind the filters to maintain a constant pressure on the softening units.*

Write our nearest office for quotations on Horton Elevated Tanks outlining your requirements as to tank capacity, service and height to bottom.

CHICAGO BRIDGE & IRON COMPANY

Chicago, 4.....2445 McCormick Building
New York 6.....3350-165 Broadway Building
Cleveland, 15.....2267 Guildhall Building
Los Angeles, 14.....1459 Wm. Fox Building
Birmingham, 1.....1511 North 50th Street
Atlanta, 3.....2143 Healey Building
Tulsa, 3.....1651 Hunt Building
Houston, 1.....5643 Clinton Drive
Philadelphia, 3.....1653-1700 Walnut Street Building
Havana.....402 Abreu Building
San Francisco, 11.....1217-22 Battery Street Building
Detroit, 26.....1566 Lafayette Building

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PENNA.

In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

FINANCIAL

▶▶▶ The usual drop in securities values following the end of the year has once again become evident, and paper mill issues as a result followed the general trend, though only to a minor extent. Drops of more than a point in value during January were almost entirely lacking.

Celotex Corporation—Net income for the fiscal year ended October 31 was $3,824,324 as against $605,525 for the preceding years.

Champion Paper & Fibre Company—Net income for twenty-eight weeks ended November 10 was $2,682,247 as against $1,113,352 for the same period in 1945.

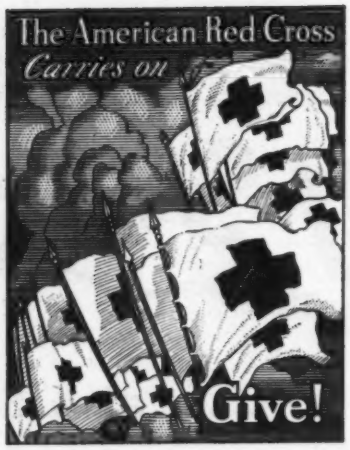
Crystal Tissue Company—Net income for the year ended December 31 was $205,658. Gross sales for 1946 amounted to $3,596,202 as compared with $2,905,985 in 1945.

Hummel-Ross Fibre Corporation—Net earnings for forty-four weeks ended November 3 were $900,664.

West Virginia Pulp & Paper Company—Net income for the fiscal year ended October 31 was $5,103,607 as against $2,142,072 a year ago.

Paper Mill Financing and Transfers

Continental Can Company—The New York Life Insurance Company has concluded negotiations for financing new manufacturing facilities for Continental Can by investing approximately $10,000,000 in the purchase of new plants under construction or planned. The insurance company will then lease the new facilities to the can company for a term of years.



International Paper Company—All collateral pledged under the company's $20,385,000 secured serial 2 per cent bank loan has been released and all mortgages against its properties, except minor purchase money liens, are being discharged, as announced by President John H. Hinman on February 1. The company paid off $2,385,000 of the old loan recently and replaced the balance with $18,000,000 new unsecured 2 per cent notes, maturing in varying semi-annual installments through December 31, 1956.

New York Stock Exchange—Stocks

	Closing Prices Jan. 27, 1947	Dec. 31, 1946
A.P.W. Products	*4⅞-5⅛	5
Celotex	29¾	31½
Same Preferred	*20⅜	20½
Certain-teed Prod.	..	20⅞
Champion P&F Co.	23⅛	25½
Same Preferred	110⅞	110
Container Corp.	42¾	47½
Cont. Diamond	11⅞	10
Crown Zellerbach	30	32⅞
Same Preferred	*106½-108	105¼
Same $4 Pref..	*118½-122	122½
Dixie Vortex	32	31¼
Same "A"	52¾	51½
Robert Gair Co..	7⅛	7¼
Same Preferred	20⅜	21
Gaylord Container	16¼	18½
Same Preferred	*90-105	107
International Paper	49¼	53½
Same Preferred	104	105
Kimberly-Clark	*23-24	23¼
Same Preferred	108	...
McAndrews & Forbes	*38-38½	36¾
Marathon	26¼	...
Masonite	56	63
Mead Corp	18¾	20⅛
Same Preferred	103¾	103½
Same 2d Pref..	47¾	48
National Container	37⅞	37¼
Paraffine Cos. ..	*72-75	77½
Same Preferred	*107-110	106¼
Rayonier, Inc. ..	23⅛	25½
Same Preferred	*35½-36⅜	36⅛
Scott Paper	45½	47½
Same Preferred	99¼	100¼
Sutherland Paper	43¾	46½
Union Bag & P...	30¼	30⅜
U. S. Gypsum...	96⅛	105¾
Same Preferred	*188-192	*187½-194¼
United Wall Paper	9⅜	9¾
Same Preferred	*48-50	46
West Va. P&P..	39⅝	39¾
Same Preferred	113	112

New York Stock Exchange—Bonds

Celotex 3½% ..	...	103¾
Champion P&F Co. 3%	103¾	103½

New York Curb Exchange—Stocks

Am Writing	...	10
Great Northern .	41	44
Hummel Ross ...	29	26⅜
St. Regis	9¾	10
Taggart	8½	8½

*Closing Bid and Asked Prices.

Attending a conference for officials and employees given by Crown Zellerbach Corporation in Longview (Wash.) January 19-22 were: Front row (L to R)—Ted Kepner, of Portland (Ore.), logging division personnel and safety supervisor; Mrs. Vera Berney, Camas (Wash.), women's personnel supervisor; and William Hart, San Francisco, general personnel supervisor. Back row (L to R)—V. C. Gault, Camas personnel supervisor; Otto R. Hartwig, Portland, general safety supervisor; Clinton Hayes, Los Angeles, supervisor for the western waxed paper division, and James D. Zellerbach, San Francisco, of the industrial relations department. The group discussed safety, personnel and other company matters during its meeting which was attended by about 50 persons

POLLUTION OF LAKE BY LOG RAFTS IS CLAIM OF WIS. CONSERVATION DEPT.

Legal action may be taken by the Wisconsin State Conservation Department in what it considers pollution of Lake Superior fishing waters by the logging activities carried on by Wisconsin paper companies in rafting timber across the lake from Canada. Claims have been made by commercial fishermen operating on Lake Superior that pollution has resulted from bark deposits and damage has been done to fishing nets. The claims have been corroborated by Dr. E. W. Schneberger, head of the state fisheries section.

In an informal session, members of the Conservation Department agreed

From Coast to Coast*,
Extensive Stocks of
B&A Reagents and C. P. Acids
at your command

"RIGHT NEXT DOOR TO YOUR LABORATORY"

To provide direct, personalized service for laboratory chemical users everywhere, the Baker & Adamson Division of General Chemical Company has its *own* chain of regional warehouses from coast to coast. Each is a strategic supply center carrying extensive stocks of B&A Reagents, C. P. acids, and other purity products for prompt delivery.

One of these B&A regional warehouses serves your territory. By taking full advantage of its facilities, you can make it the auxiliary stockroom "right next door to your laboratory" and eliminate your stock control problem.

Here's how... advise your B&A Technical Serviceman as to your specific, month-to-month reagent requirements. This way, he can plan with you in building these local B&A stocks to furnish your needs swiftly, surely, whenever you call.

You can open the door to your B&A stockroom right now by phoning or writing the nearest B&A Sales and Technical Service Office listed below.

The free 200-page book of B&A products is an excellent guide to the range of high-purity chemicals available from your regional B&A warehouse. It contains pertinent data on 1,000 products. If you have not yet received a copy, request one today on business letterhead.

REAGENTS
B&A
STANDARD OF PURITY
FINE CHEMICALS

GENERAL CHEMICAL COMPANY

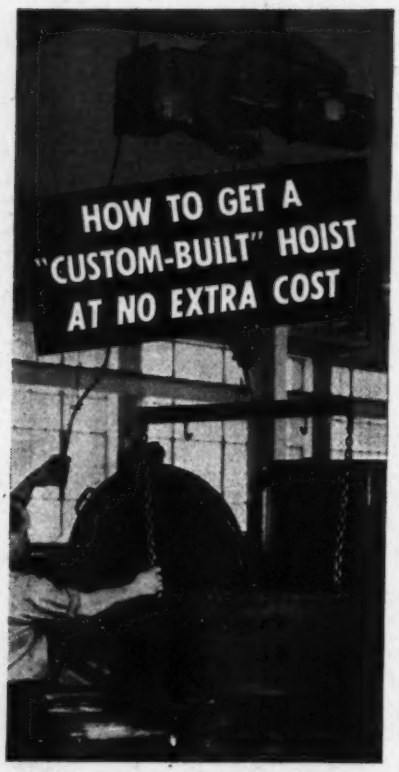
BAKER & ADAMSON DIVISION

40 RECTOR STREET, NEW YORK 6, N. Y.

Sales and Technical Service Offices. Albany* • Atlanta • Baltimore • Birmingham* • Boston • Bridgeport • Buffalo* • Charlotte* • Chicago* • Cleveland* • Denver • Detroit* • Houston • Kansas City • Los Angeles* • Minneapolis • New York* • Philadelphia* • Pittsburgh* • Providence • St. Louis* • San Francisco* • Seattle • Wenatchee (Wash.) • Yakima (Wash.)
In Wisconsin: General Chemical Wisconsin Corporation, Milwaukee, Wis.
In Canada: The Nichols Chemical Company, Limited • Montreal* • Toronto* • Vancouver*

SETTING THE PACE IN CHEMICAL PURITY SINCE 1882

* Complete stocks carried here.



At no extra engineering cost, you can have a Reading Electric Hoist that's CUSTOM-BUILT to solve your special materials handling problems.

The Reading Unit Construction Plan gives you a choice of several standard interchangeable mechanisms. With this plan you can select the type of suspension, control, hoisting and motor unit that best suits your job requirements. Imagine the advantages you get in a hoist "tailor made" to your own specifications! If your operating conditions change, you can modernize—and save costs—by simply changing one or two units.

See your distributor for more information on Reading's Unit Construction Plan or write us today for your copy of "144 Answers To Your Hoisting Problems."

READING CHAIN & BLOCK CORPORATION
2113 ADAMS ST., READING, PA.
CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING HOISTS

that unless negotiations with the companies using lake waters to transport logs could provide an effective solution to the problem, it would seek action under the law; if the law on the Department's powers is clear and no other means of eliminating the pollution is offered.

Initial efforts by the conservation authorities to negotiate a satisfactory means of preventing pollution resulted in one company's offer to re-route its rafting activities to avoid the fishing banks. Dr. Schneberger said that the route change "won't help a bit."

◆

GULF STATES MILL ADDITION CONTRACT TO H. K. FERGUSON

An increase in production from 100 to 150 tons daily is expected from the expanded facilities of the Gulf States Paper Corporation plant in Tuscaloosa, Alabama. The new mill addition contract has been awarded to The H. K. Ferguson Company, New York City, calling for the engineering, construction, and installation of the process equipment.

Included in the new construction will be the installation of a new paper machine, together with the necessary pulp production facilities, recovery equipment, and other auxiliary process units. Also, plans call for the building of a personnel building to serve plant employees. Authorization for the expansion project has been rendered by the CPA.

■

NINETEEN-MILLION-DOLLAR CONSTRUCTION PROGRAM FOR W. VIRGINIA PULP & PAPER

Construction plans being carried out by the West Virginia Pulp and Paper Company, at each of its six mills will involve an investment of $19,000,000. At the Charleston, South Carolina, plant the installation of a kraft machine will cost $5,000,000.

This move reflects the company's activities of 1946, during which time a production record was established almost equaling rated capacity. Working on a twenty-four hour basis throughout the year, the six West Virginia company mills produced 597,984 tons of paper and paperboard; this constitutes an increase of 6.63 per cent over the previous year.

Sales rose 13.6 per cent to $67,211,929, and net earnings reached $5,103,607 from $2,142,072 in 1945. After payment on preferred dividends was made, $4.93 was earned on common stock, compared to $1.63 earned in 1945. In addition to operational earnings, a non-recurring profit of $2,174,411 was derived from the sale of timber.

HUMMEL-ROSS PLANT IS SOLD TO CONTINENTAL CAN

Approval by the stockholders of Hummel-Ross Fibre Corporation on February 4 of a transaction which had been approved by the company's directors on December 6, resulted in the sale of the company's plant at Hopewell, Virginia, to the Continental Can Company, New York City.

Hans Eggerss

The transaction involved an exchange of three shares of Continental common for four shares of Hummel-Ross common. According to this plan, 293,780 shares of the authorized but unissued shares of Continental common will be exchanged for 391,705 shares of Hummel-Ross common.

The Hopewell plant will be used to supply raw materials for the Van Wert (Ohio) and Reading (Pa.) plants of The Container Company, one of Continental's principal subsidiaries.

Hans A. Eggerss, president of Continental, stated that the production output of the newly acquired mill will gradually be taken over by Continental during the next six to eight months.

Fred E. Hummel, president of the Hummel-Ross organization, will serve in an advisory capacity. John W. Sales will continue in his present position as general manager.

◆

IMPROVEMENT PROGRAM AT MOSINEE NEAR COMPLETION

All phases of the $300,000 mill improvement program developed by the Mosinee Paper Mill Company (Mosinee, Wisconsin), which includes a new stock chest, a new blow tank, a continuous washing system for pulp, and an additional liquor furnace are nearing completion. Norman S. Stone, vice president and general manager of

the company, reported that the improvements are part of plans made over the years but delayed until materials for plant installations were available.

Operation of the improved Dekered stock chest, which went into construction early in December, began January 5. A crew of forty men working three eight hour shifts daily installed the chest. This new equipment more than doubles the capacity of two former chests and insures the maintenance of a better quality pulp used by the mill.

The new blow tank, which has a capacity of 515 tons of stock including liquor, was placed in operation in January. The unit is housed in an addition thirty-four feet square and will take pulp directly from the digesters. The stock will be washed and filtered four times in a new Oliver Brown stock washer.

Work on the new liquor furnace began early last summer and will be completed this month. The furnace is the complete water-wall type, and when in operation, it will replace three smaller furnaces.

◆

N. Y. UNIVERSITY OFFERS PULP & PAPER TECHNOLOGY COURSE IN SPRING TERM

Twin courses in Pulp and Paper Technology and Printing Inks will be offered during the spring term by New York University's Division of General Education. The study programs are opened to salesmen, as well as, those from the industry engaged in the handling and processing of paper products and inks.

Pulp and Paper Technology is offered for the first time at the school's spring session. The course was organized by Harold Annis of the Oxford Paper Company in collaboration with R. G. Macdonald, Secretary of TAPPI. Mr. Annis will co-ordinate a schedule calling for fifteen lectures by paper industry experts. The meeting place for classes has been announced as the Willkie Memorial Building, 20 West 40th Street; the meeting time has been set for Thursday evenings, 6:15 to 8:00 p.m., beginning February 6.

Printing Inks was offered for the first time during the fall session of 1946 and will be continued over the spring term. The course is under the direction of Dr. William Hodgkiss of the research department, Sun Chemical Corporation. The Printing Ink classes will be held at the Washington Square Center of the University.

Further information concerning both courses can be secured from the Division of General Education, the University's Adult School, at Washington Square, New York 3.

SODIUM SULPHATE

SODIUM CARBONATE

For Immediate Sale

In natural surface lake deposits located in Wyoming, just off Highway 287, midway between Casper and Rawlins; has never been accurately surveyed; high spot estimates indicate at least 500,000 tons of sulphate and 28,000 tons of carbonate waiting for development; any reasonable offer, preferably on royalty basis, will be considered; inquiries for further detail invited.

NATRONA ALKALI COMPANY

Room 9026 Du Pont Building

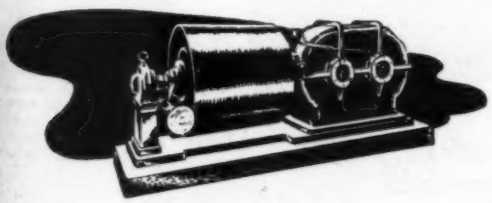
Wilmington (98), Delaware

APPLETON FELTS

Make **GOOD** *Paper*

APPLETON WOOLEN MILLS, APPLETON, WISCONSIN

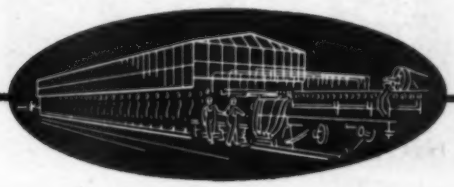
A SIGNATURE
IN STEEL



Every bite of every tool leaves a mark upon its work--like signatures, in steel. Every Bagley & Sewall man knows and writes our signature. Microscopic tolerance--extra care--check and double check. That's why Bagley & Sewall Machines perform so satisfactorily. Seventy-seven years of experience stand behind their modern design. The world's most extensive plant for producing paper machines is back of their creation. If you plan to install paper machinery--check with our engineers.

BAGLEY & SEWALL

WATERTOWN, NEW YORK



For trouble-free flow control ..... install POWELL Valves

There are at least two notable reasons why Powell Valves minimize flow control troubles. One is that every valve in the Powell Line has been scientifically designed to operate under certain specific flow control conditions—pressure, temperature and/or media. The other is that there's a Powell Valve for *every* operating condition, or set of conditions, known today.

That's why so many plants, representing every phase of modern industry, are now standardizing on Powell Valves.

Fig. 1793—125-pound Iron Body Bronze Mounted Gate Valve. Has flanged ends, outside screw rising stem, bolted flanged yoke, bronze seat rings and taper wedge solid disc. Also available in All Iron.

Fig. 6031—Class 600-pound Cast Steel Globe Valve. Has flanged ends, outside screw rising stem and bolted flanged yoke.

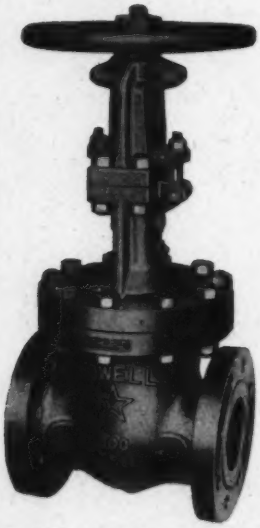


Fig. 3003—Class 300-pound Cast Steel Gate Valve with bolted flanged yoke, outside screw rising stem and taper wedge solid disc.

Fig. 1708—200-pound Bronze Globe Valve with screwed ends, union bonnet, renewable, specially heat treated stainless steel seat and regrindable, renewable, wear-resisting "Powellium" nickel-bronze disc

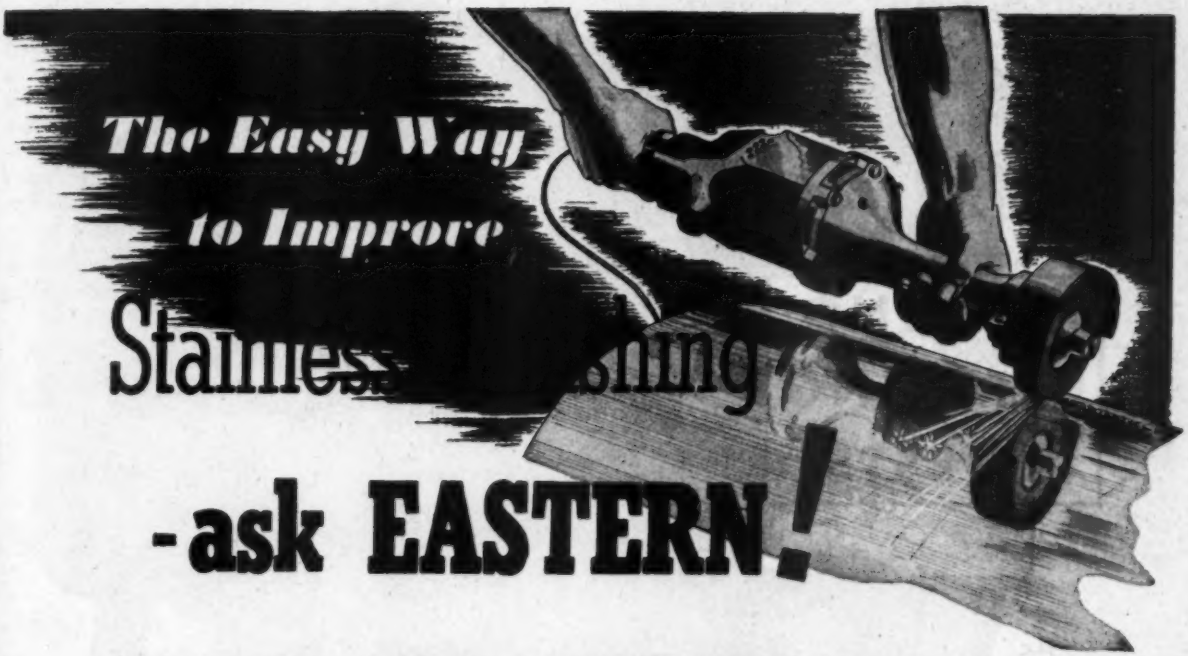
Fig. 241—125-pound Iron Body Bronze Mounted Globe Valve. Has flanged ends, outside screw rising stem, bolted flanged yoke, and regrindable, renewable bronze seat and disc. Also available in All Iron.

Fig. 375 — 200-pound Bronze Gate Valve with screwed ends, inside screw rising stem, union bonnet and renewable, wear-resisting "Powellium" nickel bronze disc.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES



Grinding Weld Zones? What sequence of abrasive grit sizes is best for refinishing a weld zone in E-S 18-8 (Type 302) to a No. 4 polish? How can we prevent a groove at the weld?

Abrasive Type? Are different types of abrasives required for polishing and buffing stainless steels than for other grades of steel?

Blending High Finishes? Practically no polishing wheels are wide enough to cover the area of our product, so highlights show up after final polishing. How can we blend the entire area into a uniform finish?

Electropolishing? What cleaning operations are required before stainless steel products can be electropolished? Will electropolishing remove light weld scale and heat discolorations from stainless?

Passivating Necessary? We generally improve the corrosion resistance of finished stainless steel parts by passivating in 30% nitric acid. Would this be necessary if they were electropolished?

No matter what problems you may have in grinding or polishing stainless sheet or plate—when you need answers, you can get them from Eastern. Whether you are grinding welds in plate . . . buffing sheet to a mirror finish . . . or electropolishing, Eastern technical men can give you help in a hurry. Yours is an open invitation to call, wire, or write us for whatever assistance you may need in fabricating any type of stainless sheet or plate. And, to have a wealth of information always on your desk, ask for your copy of our catalog, "Eastern Stainless Steel Sheets." JMLooE-A1

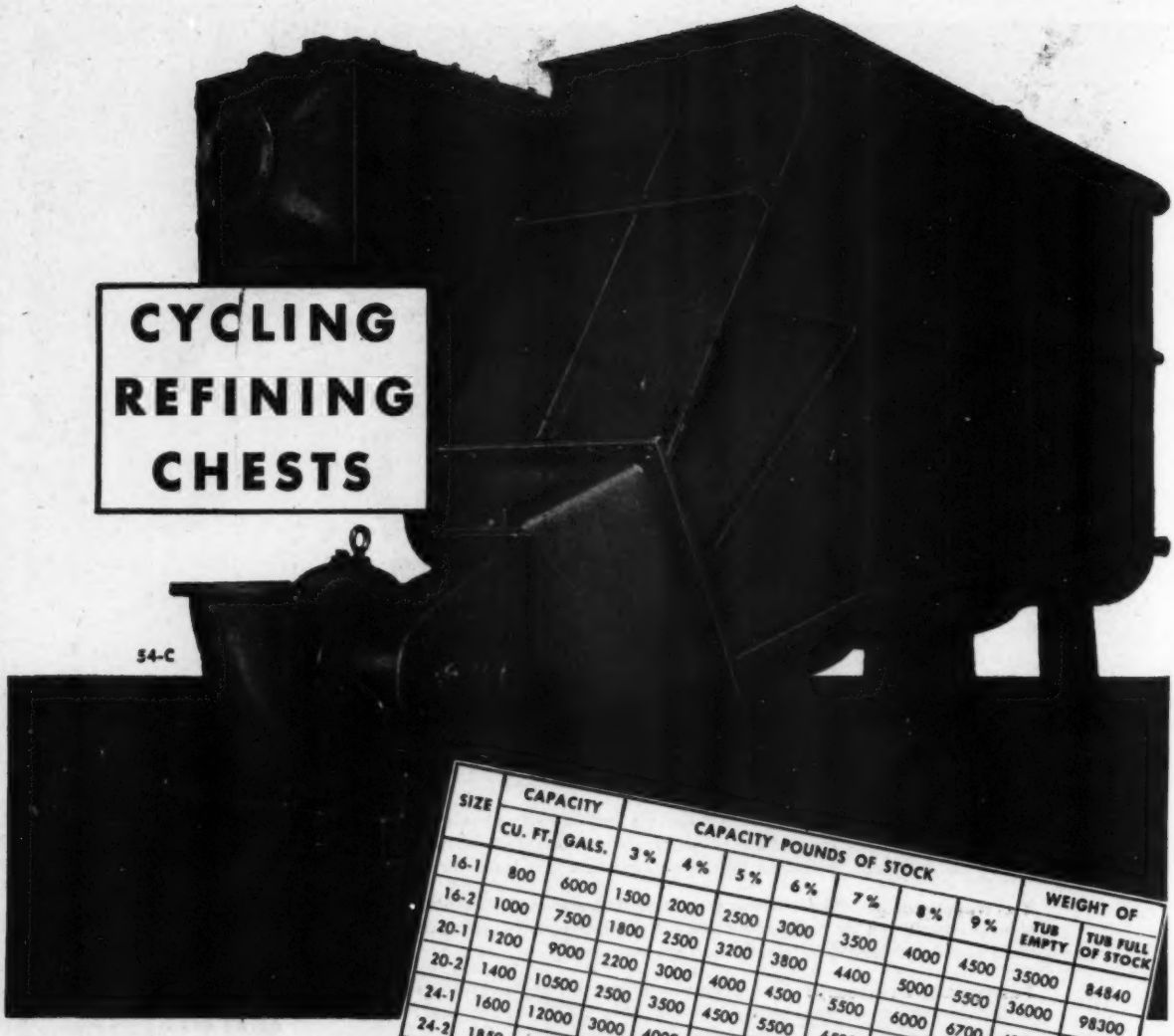
Ask Eastern for the Answer when Stainless is the Question

EASTERN STAINLESS STEEL CORPORATION

BALTIMORE 3, MARYLAND

ES EASTERN STAINLESS

CYCLING REFINING CHESTS



54-C

SIZE	CAPACITY		CAPACITY POUNDS OF STOCK							WEIGHT OF	
	CU. FT.	GALS.	3%	4%	5%	6%	7%	8%	9%	TUB EMPTY	TUB FULL OF STOCK
16-1	800	6000	1500	2000	2500	3000	3500	4000	4500	35000	84840
16-2	1000	7500	1800	2500	3200	3800	4400	5000	5500	36000	98300
20-1	1200	9000	2200	3000	4000	4500	5500	6000	6700	43500	118260
20-2	1400	10500	2500	3500	4500	5500	6500	7000	8000	44500	131720
24-1	1600	12000	3000	4000	5000	6000	7000	8000	9000	46500	146180
24-2	1850	14000	3500	4500	6000	7000	8000	9000	10000	47500	162755
30-1	2400	18000	5000	6000	7500	9000	10500	12000	13500	63800	214320

• It hardly seems logical for a mill to install new preparation equipment but retain old chests that do not have proper contours to permit most efficient circulation. Such misfits invariably defeat objectives sought.

In such situations the logical chest to install is the one here illustrated — an all-metal job properly proportioned for most efficient operation.

This chest will not channel the stock, being similar to a cast-iron beater on the inside. It will handle 8% stock due to the bottom slope. It can be quickly erected and as quickly taken down for relocation elsewhere, if desired. Washdown water can be held to a minimum.

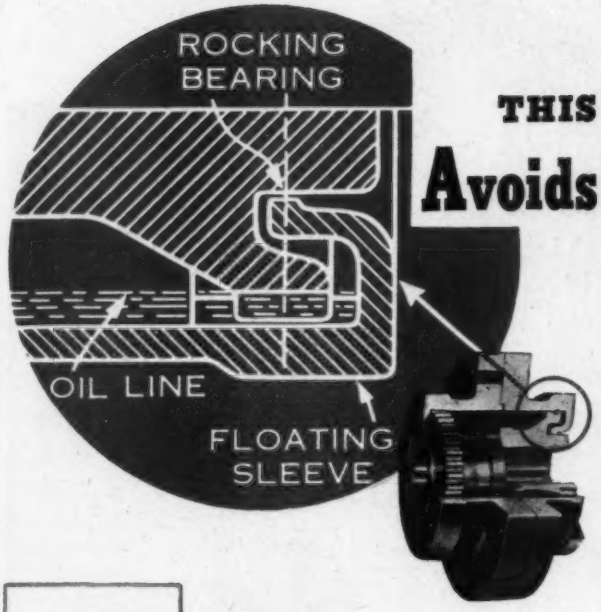
Available in full range of sizes. Chests of all other types also built.

THE BLACK-CLAWSON COMPANY
HAMILTON, OHIO

Dilts

Division: SHARTLE BROS. MACHINE CO., MIDDLETOWN, OHIO
Dilts Machine Works, Fulton, N. Y.

54-A. "Smooth interior of Standard Paddle Type Chest."

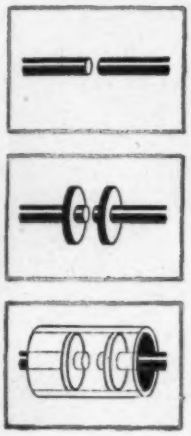


THIS METAL-TO-METAL SEAL

Avoids Coupling Shutdowns!

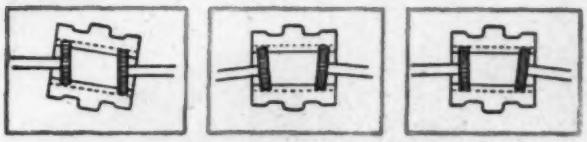
Fast's Couplings Have No Flexible Materials, Give Continuous Service

That's right! There are *no* perishable parts in a Fast's Coupling. Nothing to wear. No parts to be replaced. Even the load-carrying oil is guarded by a positive *metal-to-metal* seal. This *exclusive* "rocking bearing" (shown at left) keeps the oil free of moisture, dust, flying grit without use of perishable oil-retaining rings. Result: no shutdowns due to wear from dirt, abrasives or other foreign materials in oil.



Fast's Couplings Are Simple As A-B-C

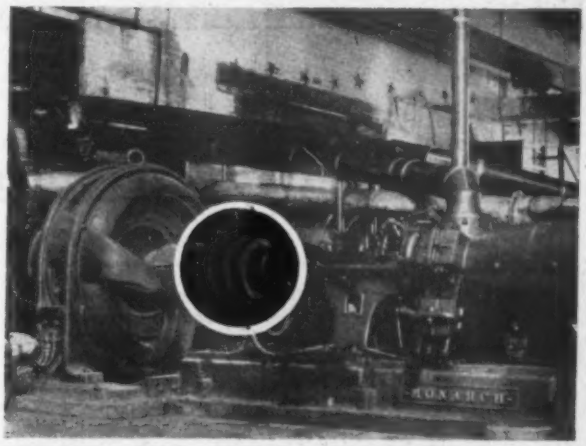
See the simple development of Fast's Couplings. A splined hub on each shaft end, a sleeve with internal splines to mesh. Oil in the sleeve carries the load between the splines.



Fast's Couplings Compensate for All Misalignment

The floating sleeve takes a neutral position. All forms of misalignment are compensated for between the lubricated faces of the splines, equally divided between the driving and driven members. The entire assembly revolves as one unit.

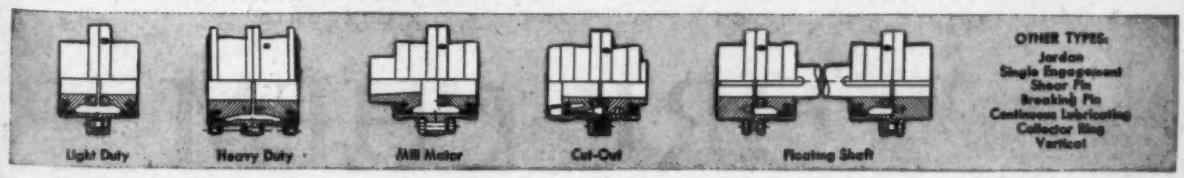
WRITE TODAY for our complete catalog, containing valuable information on Fast's self-aligning Couplings for practically every power transmission condition met in industry. It will help you lengthen the life of your machines, reduce upkeep costs, cut shutdown losses. Koppers Company Inc., Fast's Coupling Dept., 232 Scott Street., Baltimore 3, Maryland.

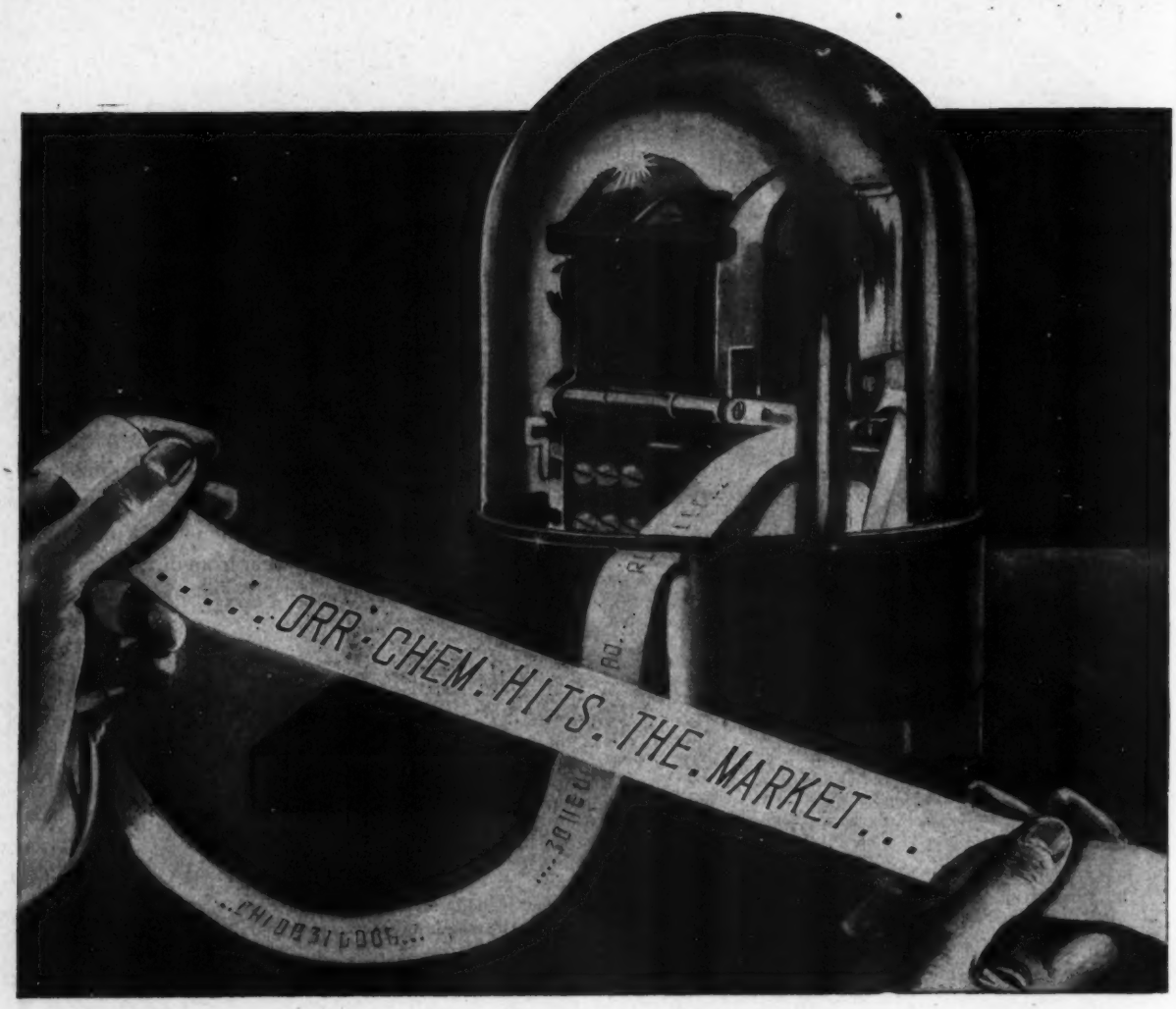


This Fast's No. 5 Telescopic Coupling transmits power to a Jordan at the Champion Coated Paper Company, Hamilton, Ohio.

KOPPERS

FAST'S *self-aligning* COUPLINGS





NEW FELT AMAZES SUPERINTENDENTS

Five years of search by Orr for a way to make felts wear longer led to the development of special equipment — equipment designed so to treat a felt that the chemical used actually becomes a part of the fibre and cannot wash out — a treatment that is positively permanent.

ORR-CHEMs, sent to virtually all Miami Valley mills for trial, had astonishing results. Today over 100 mills—on almost all grades—are regular users.

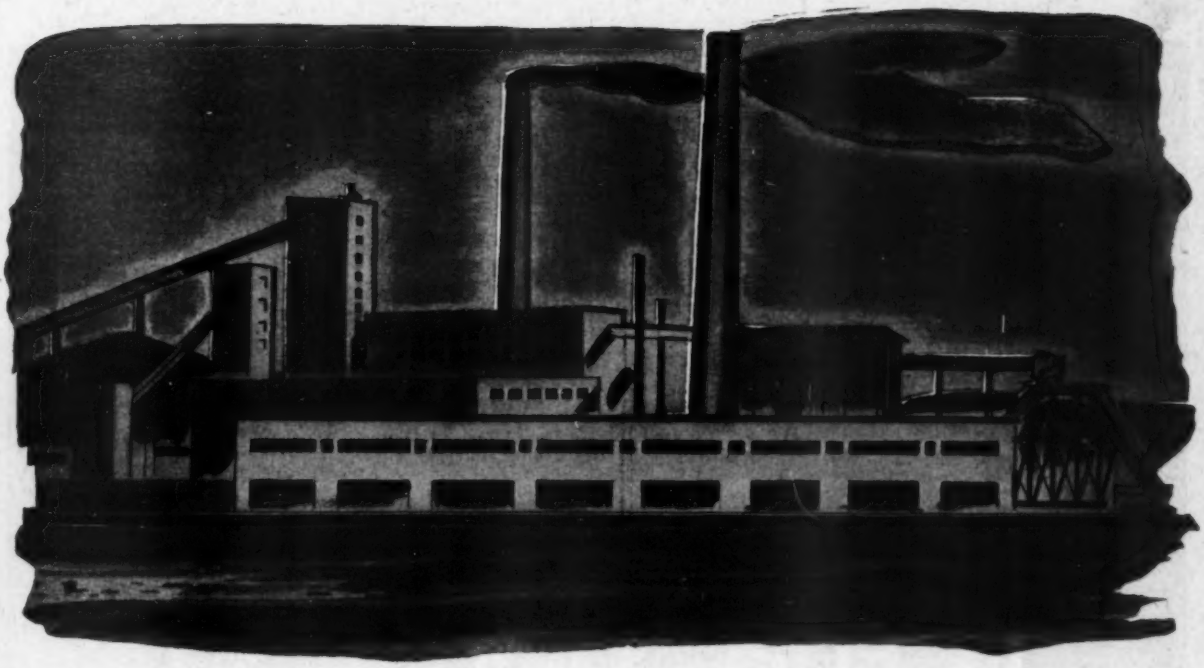
PERFORMANCE CHARACTERISTICS OF ORR-CHEM FELTS

How about porosity? There is actually faster drainage, hence far less suction or shower water required. *Does chemical wash out of the fibres?* It does not, whatever time felts are on or number of washings. *How about shrinkage or stretch?* When put on the machine straight, felts hold their position, and machine-wise stretch or contraction or cross shrinkage is less than normal.

Remember — 100 superintendents "in the know" are enthusiastic about ORR-CHEMs and are standardizing on them. They realize that at last new, better and more economical felts actually have arrived. Write Sales Department for further particulars, including many case histories.

THE ORR FELT & BLANKET CO.
PIQUA, OHIO

ORR-CHEM



WHAT GOES ON IN THIS PAPER MILL...

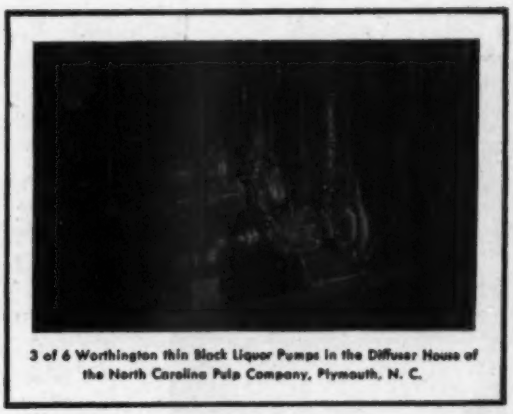
in addition to making paper?

Many paper mills today are *also* turning out chemical by-products of wood . . . such as tall oil, alcohol, resins, turpentine used in the manufacture of soaps, plastics, paints — to name a few. What new kinds of by-products will be made in paper mills of the future can't be said for sure right now.

What *is* certain is that the processing of chemical by-products calls for the right pumps — often specially-developed pumps — such as Worthington builds now . . . and *will* engineer to solve your future problems.

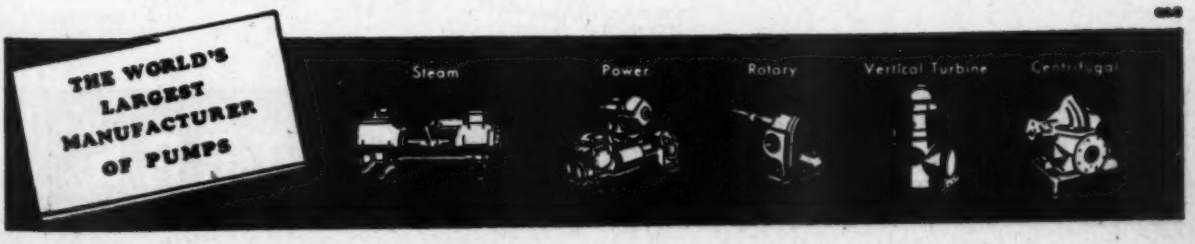
Worthington P.A.E.'s* offer the most in experience and know-how of pump application for all types of pulp and process problems. Worthington offers all types and sizes of centrifugal pumps to *overcome* these corrosion, abrasion, heat viscosity and solidification problems. If you need the right pumps now . . . or will need . . . . . you'll learn that *there's more worth in Worthington* by phoning our nearest office or writing to— *Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, N. J.*

*P.A.E.—Pump Application Engineer.



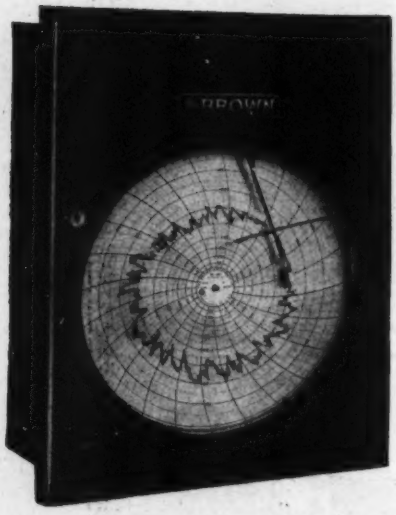
3 of 6 Worthington thin Black Liquor Pumps in the Diffuser House of the North Carolina Pulp Company, Plymouth, N. C.

WORTHINGTON



grasp these savings

in FUEL DOLLARS !



Brown Electric Recording Integrating Flow Meter

STEAM ACCOUNTING LOWERS COSTS IN PAPER MILLS

Consider the savings in fuel dollars that you can make ***each day*** by just a few per cent reduction in steam consumption.

In paper mills, where steam consumption (and costs) are tremendous, the savings possible through the Brown Steam Accounting System are equally large.

Steam Accounting Systems are based on Totalizing Flow Meters. These flow meters tell you the cost of steam . . . where it is going . . . where fuel dollars are being wasted.

Before you can effectively cut down steam consumption, you must have these facts. Brown Totalizing Flow Meters give you the ***complete facts.***

Permanent two-fold records show: first, rate of flow at all times enabling you to correlate the steam load with paper production; second the automatic planimeter pen records the amount of flow, making it possible to analyze steam usage during any period. An additional integrator dial totalizes flow.

The large savings that other paper mills are obtaining ***now*** can be effected in your plant, too.

Write for complete information. THE BROWN INSTRUMENT COMPANY, a division of Minneapolis-Honeywell Regulator Company, 4489 Wayne Avenue, Philadelphia 44, Pa. Offices in all principal cities.

TORONTO, CANADA
STOCKHOLM, SWEDEN

LONDON, ENGLAND
AMSTERDAM, HOLLAND

BROWN FLOW METERS

. . . MINNEAPOLIS - HONEYWELL CONTROL SYSTEMS . . .

FOR BOOK PAPER PROCESSING

Diamond PRODUCTS MEET EVERY SPECIFICATION

- SODA ASH
- CAUSTIC SODA
- LIQUID CHLORINE

ALKALI

DIAMOND ALKALI COMPANY

PITTSBURGH 22, PA., *and Everywhere*

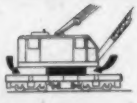
America's Number One

Locomotive Crane

Ask the man in the cab!

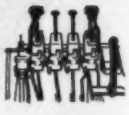
NO DANGEROUS SWINGING DOORS

ENCLOSED ROLLER-BEARING TURNTABLE


14-INCH "LIFEGUARD" DECK CLEARANCE

WIDE ANGLE WORK VISION

ENCLOSED OIL-BATHED TRANSMISSION


AIR POWERED ANTI-FATIGUE CONTROLS

You'll be building mountains of pulpwood again some day . . . so why not plan ahead with AMERICAN HOIST? The new diesel Locomotive Crane pictured here moves 25% to 100% more tonnage . . . faster, more smoothly than ever before. Effortless air controls keep the operator fresh and alert all day. AMERICAN diesels have been newly designed from trucks to boom-tip *to match and balance perfectly all diesel power characteristics.* There is no comparable crane . . . no comparable bargain in cost per ton of load moved!

American Hoist

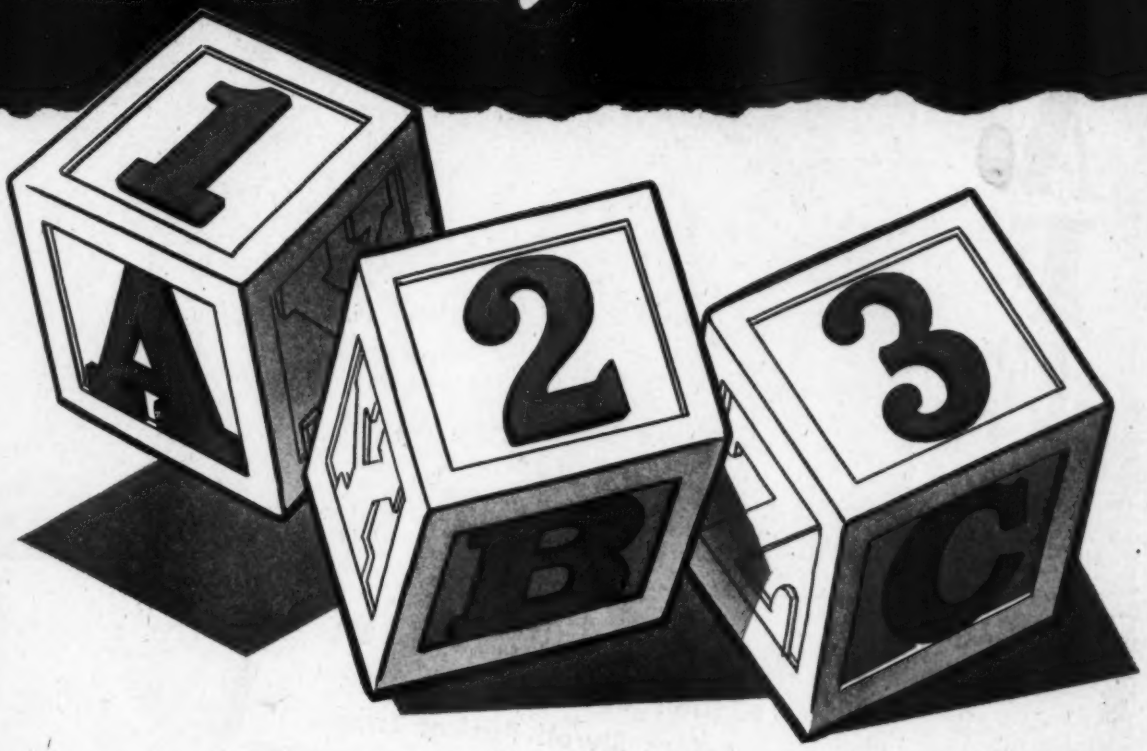
and DERRICK COMPANY

St. Paul 1, Minnesota

Plant No. 2, So. Kearny, N. J.
Sales Offices:
Chicago, Pittsburgh, San Francisco
New Orleans, New York

735

It's as easy as...



to use coded lubrication

1 Why you need it. Standard's Coded Lubrication provides one of the simplest known methods for helping oilers determine what lubricant is needed at every lubricating point in your plant. It helps them avoid errors in filling oil cans, grease guns and other dispensing equipment. It eliminates the need for their learning a great number of detailed instructions and grade numbers of lubricants.

2 How it works. All lubricants used in the plant are assigned numbers. A number is applied to each storage container or dispensing unit indicating the lubricant it contains. Each spot to be lubricated is also marked by an easily applied decal numbered to indicate the lubricant required.

3 What it does! The results you get with Coded Lubrication make it well worth while. It reduces breakdowns resulting from the application of wrong lubricants. It prevents application of costly lubricants where ordinary lubricants can be used. It simplifies training of oilers.

A Standard Oil Lubrication Engineer will fully explain Coded Lubrication and its application to your plant. Write Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

SAFETY

for men and material

one of the reasons why the paper industry prefers Elwell-Parker Trucks

When you own Elwell-Parkers, the *maximum protection* they provide is a great source of satisfaction. Elwell-Parker users appreciate these features:

POSITIVE "ON-OFF" CONTROL—Truck cannot move unless operator stands on *both* pedals. Likewise it stops when he steps off the pedals, because brakes are applied and power is shut off.

SEPARATE OPERATION OF POWER AND BRAKE—This feature is invaluable when starting heavy loads on ramps, since power is applied before brake is gradually released. No fuses in power circuit but Elwell-Parker motors take the full electric current the battery supplies.

SAFETY CONTROL—Drive controller turns to "off" the moment operator releases handle. Limit switches and electric brakes automatically control, and overload slip clutches protect the other motors.

EASY HANDLING—By reducing operator fatigue, insures careful driving. Operators are always alert because Elwell-Parker Trucks have cushioned pedals, easy steering, controlled speed and smooth, quiet operation.

SUPER STRENGTH—Elwell-Parker Trucks are "tank-tough" in both fabrication and materials. This strength is another assurance of safety in operation.

LESS FIRE HAZARD—All trucks carry Underwriters' Laboratories' UL Seal. Elwell-Parker built Class B motors have more costly glass and asbestos insulation.

Yes, Elwell-Parker advanced design and construction enable you to *forget* truck safety problems. For proper application of these trucks to your specific needs call in the nearest E-P man. The Elwell-Parker Electric Co., 4241 St. Clair Ave., Cleveland 14, O.

Here's why they buy
Elwell-Parkers
and keep on buying 'em

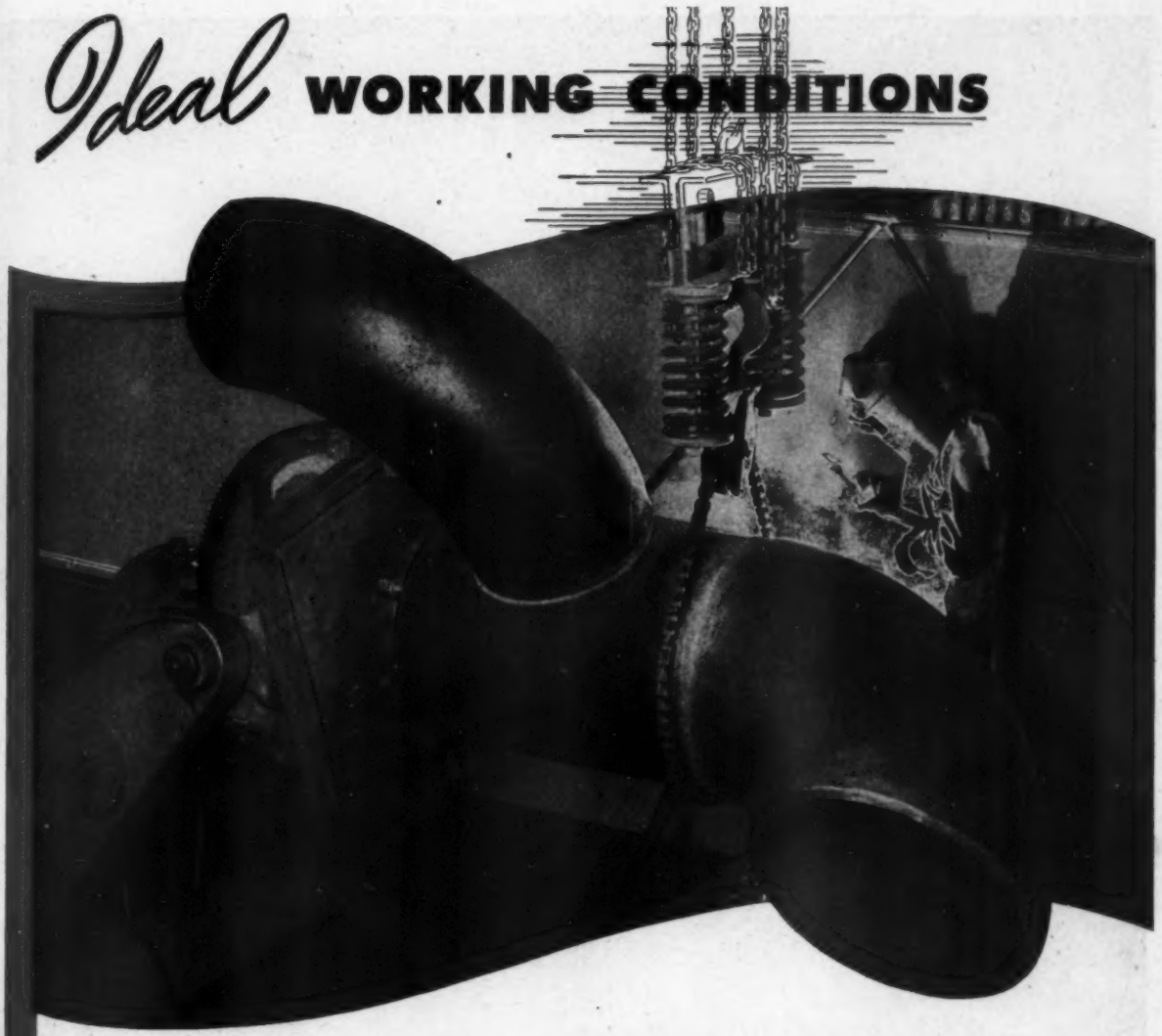
Longer Life
Ample Power
Greater Safety
Easy Handling
Super Strength
plus
ELWELL-PARKER'S
unmatched experience in materials handling.

ELWELL-PARKER

established 1892

POWER INDUSTRIAL TRUCKS

Ideal WORKING CONDITIONS



. . . *Another Reason for the Superiority of Modern* SHOP FABRICATION

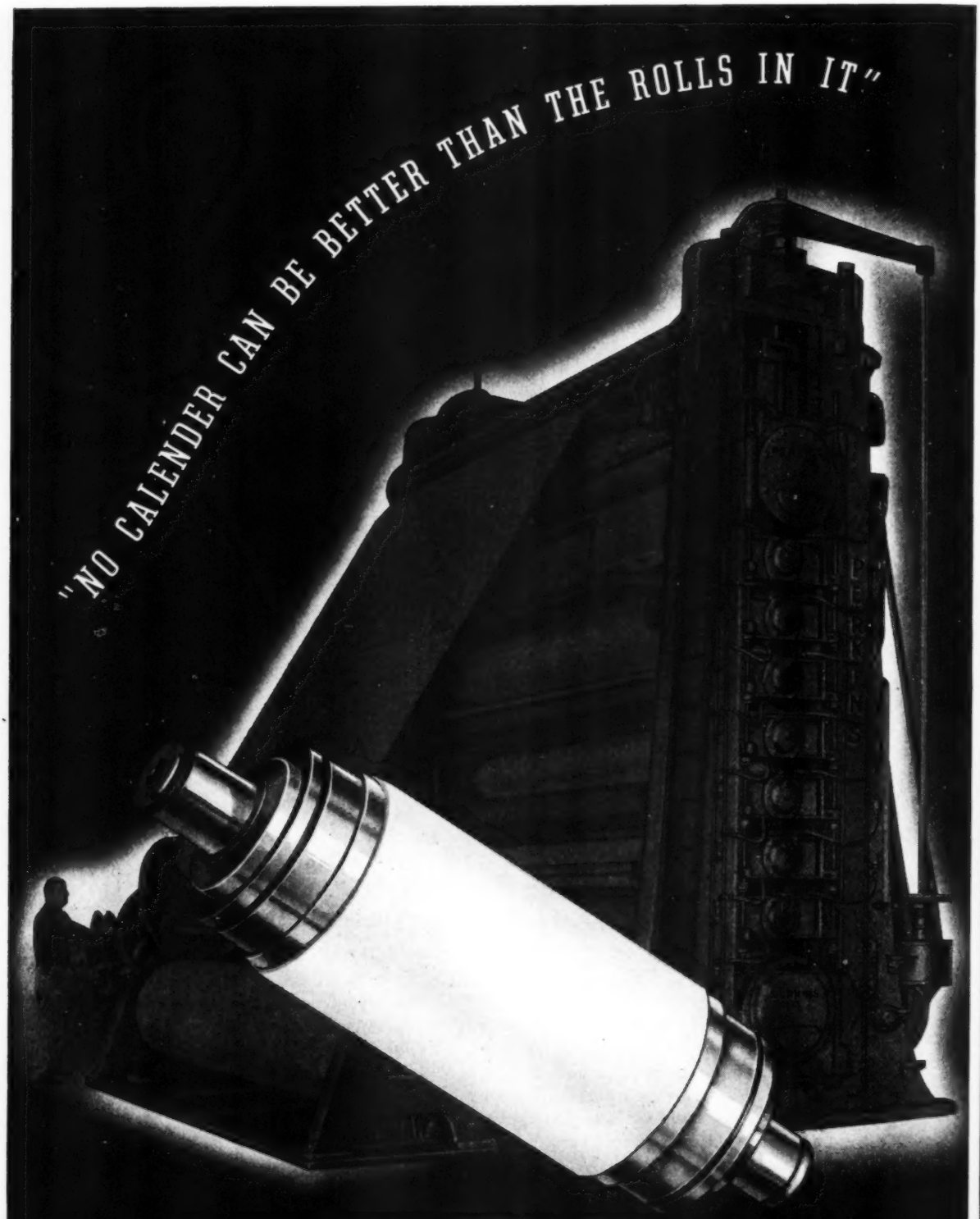
DIFFICULT fabrication that cannot be done efficiently in the field is handled easily in the completely equipped Pittsburgh Piping plant. For example, shop equipment such as that illustrated, enables the welder to work in a down-hand position on circumferential welds. Each weld is inspected, and laboratory facilities are utilized as required to analyze welding specimens.

Quality—the important factor in the safe performance of any installation—is assured when piping is pre-fabricated in the shops of Pittsburgh Piping and Equipment Company.

The advantages of shop fabrication—extended experience, specialized engineering help, every facility for bending, Van Stoning, machining, heat-treating, stress-relieving, pressure-testing—assure an infinitely better piping job.

40 Forty-Third Street—Pittsburgh, Penna.
Woolworth Building, New York
Chamber of Commerce Bldg., Indianapolis
Book Tower, Detroit
525 Market Street, San Francisco
People's Gas Building, Chicago
Public Square Building, Cleveland
10 High Street, Boston
Heights State Bank Bldg., Houston
Whitehead Building, Atlanta

"NO CALENDER CAN BE BETTER THAN THE ROLLS IN IT"



B. F. PERKINS & SON, Inc.

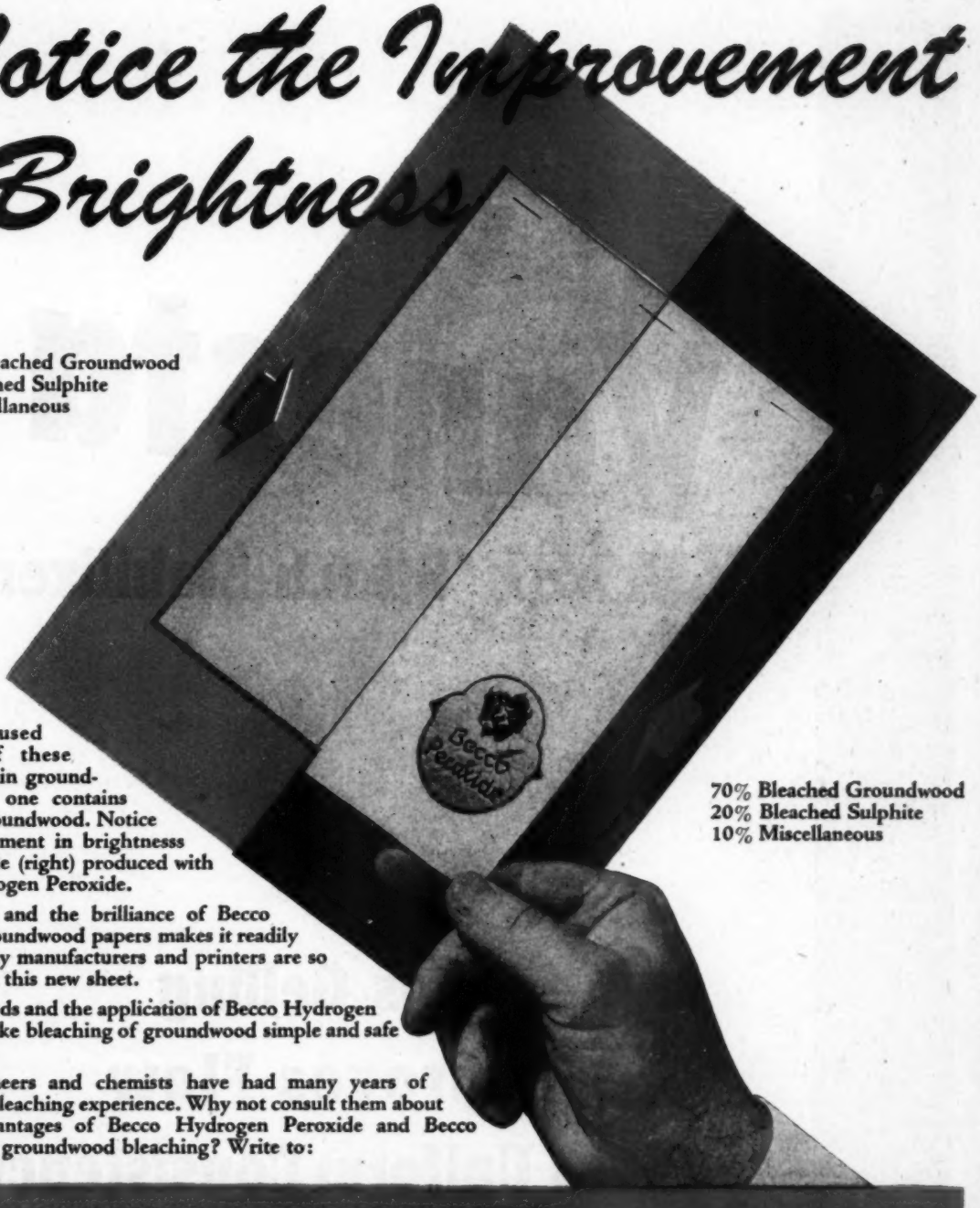
ENGINEERS AND MANUFACTURERS

HOLYOKE, MASS.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

Notice the Improvement in Brightness

70% Unbleached Groundwood
20% Bleached Sulphite
10% Miscellaneous



70% Bleached Groundwood
20% Bleached Sulphite
10% Miscellaneous

The pulp used in both of these papers contain groundwood, only one contains bleached groundwood. Notice the improvement in brightnesss of the sample (right) produced with Becco Hydrogen Peroxide.

The clarity and the brilliance of Becco bleached groundwood papers makes it readily apparent why manufacturers and printers are so interested in this new sheet.

Becco methods and the application of Becco Hydrogen Peroxide make bleaching of groundwood simple and safe in the mill.

Becco engineers and chemists have had many years of specialized bleaching experience. Why not consult them about all the advantages of Becco Hydrogen Peroxide and Becco methods for groundwood bleaching? Write to:

BECCO

BECCO SALES CORPORATION
AGENTS FOR BUFFALO ELECTRO-CHEMICAL COMPANY, INC.
20 Sawyer Avenue, Buffalo 7, N. Y.
New York Boston Philadelphia Chicago Charlotte

Vanesta

A *NEW* Starch Stabilizer

Stops Gelling

Improves Flow

Gives Uniform Consistency

Sample on request

R. T. VANDERBILT CO., INC.

230 Park Avenue, New York 17, N. Y.

EDITORIAL

The Unsatisfied Demand

▶▶▶ FOR THE YEAR 1946, the paper industry came through with a domestic production performance of 19,157,208 tons. However, when paper imports are added, there was available last year 22,381,000 tons for consumption.

This is a top record figure and to the famished consumers, a welcome addition. But it all went into instant, current consumption and did not in any way satisfy the hungry demand of those consumers, who, like Oliver Twist, ate all their victuals and then asked for more—unsatisfied. More and more tonnage is demanded.

Table 1

Year	Tons Production	Tons Consumption	Pounds per Capita
1946	19,157,208	22,381,000	317
1941	17,762,365	20,418,188	309.4
Increase	1,394,843	1,962,812	7.6

Now look at the increase in 1946 figures: Increased production of 1,394,843 tons averages only 232,474 tons per year for the five years, and 1,962,812 tons for increase of consumption averages only 392,562 tons per year for the five years, 1942 through 1946.

Table 2

1946	Tons Production	Tons Consumption	Pounds per Capita
Potential	23,356,803	25,605,435	363
Actual	19,157,208	22,381,000	317
Deficit	4,198,595	3,224,435	46

Current production is totally inadequate to supply the demand at present and for the near future. Let us look at the figures and compare them with the previous high figures for the year 1941. The box score looks like figures in Table 1.

The reason we make the comparison between 1946 and 1941 is because, first of all, they are the two record years of top performance since 1940. Secondly, during those five years in which the industry experienced a constantly increasing demand for its products, there was a decline of production, as witness the fact, that following 1941, the production never equaled the production of 1941 until 1946—*five long years of prodigious demand* and consequent shortage of supply.

Don't mistake our meaning. The industry did a handsome job during the past five years under extraordinary and unprecedented handicaps:

Impact of the war

Loss of many woodsmen in 1942

Further loss of skilled mechanics in that highly skilled industry

Delayed recognition by the Government of the essentiality of paper products to the war economy

That period witnessed a continual increase in population and the biggest end-use expansion of paper industry products—multiplying the demand for fulfillment.

We are pleased—as every other consumer must be—at the evidence contained in the 1946 figures, which show production is once more on the increase. Our point is that the gain shown is inadequate, good as it was. The probable potential demand is today problematical. According to our findings, the potential box score for 1946 should look like Table 2.

In contrast with the 1946 "actual," the "potential" figures, based on trends, show what the industry's performance should have been.

The Census Bureau has estimated that the population of the United States will be 145,800,000 in 1950. That would call for 27,387,500 tons, which would make the score look like Table 3.

That's the way the score looks now. But let us consider the probability that by 1950 we will be needing more tonnage. The population of this country is growing at the most amazing rate ever known. In the decade from 1930 to 1940, our population increase was 8.8 millions. In the 1940 to 1950 decade, we shall add seventeen to twenty millions. Therein lies the basis of the ever increasing demand for paper products.

Table 3

Year	Tons Production	Tons Consumption	Pounds per Capita
1950	25,259,557	27,387,500	375
1946	19,157,208	22,381,000	317
Deficit	6,102,349	5,006,500	56

COCKEYED ECONOMY

WILLIAM SIBLEY

▶▶▶ FOR THE LOVE OF PETE, let's get back to fundamentals—both in thinking and in doing. . . . The same fundamentals that made this nation great. The cockeyed economy that was imposed upon us by the New Deal in 1932, plus four years of war which mesmerized us with outlandish mathematics, has changed a lot of erstwhile hard-working Americans into a bunch of "gimme" guys.

Shortly after my discharge as a soldier in World War I, I joined the American Legion. Almost as promptly, I got out, because for the most part the fellows who made up that Hero's Union were, at that time, far more interested in getting a sizable bonus from the Government than they were in improving conditions in veterans' hospitals where, for the disabled and the maimed, the war was still going on. (It *still* is for some of the fellows!) And while I wrote beaucoup articles and editorials fighting against the bonus (I lost), we all can look back at that pittance and realize that, in the light of present-day demands, the World War I handout was about as big as a Rockefeller dime.

Today the veterans are *really* going to town in their demands for more and bigger dollars. They even want higher pay for going to school! (And they may get it!) The veterans who are apprenticing in factories are demanding that Uncle Santa Claus remove the ceiling on the amount of pay they can draw. (And they'll likely get that, too.)

Shades of Wallace and his plowed-under cotton and little pig slaughter, farmers are even now being given checks for destroying potatoes! . . . Will we never learn? Those same farmers are now demanding that the Government fulfill its price guarantees and even raise the level of those guarantees.

Old folks want bigger pensions. The Townsendites are again becoming active with their lobbying in both state capitals and at Washington. And while there is small chance that their demands to "give us the dough and we'll spend it" will be granted, such lobbying can only end in a costly compromise.

Builders want bigger and better subsidies and public works. The Government is currently financing the building of so-called "prefabricated" houses which are about as big and attractive as a two-car garage and which will surely become eye-sore slums in a few years. People will live in them now because they have no other place to live. But let dwelling construction more nearly catch up with the demand, and this nation will be dotted with hundreds of thousands of undesirable and, practically speaking, unlivable houses. Would *you* think it a good risk to loan a GI $7,500 to enable him to buy a cracker-box frame house worth $3,000, then take his note and contract for him to pay you the loan back again at so much per month for twenty years, knowing full well that in five years that GI will be able to buy a far more desirable place? That's what your Government is doing every day. How is the Government going to keep its GI debtors paying for something they don't want or need? Will it put them in jail?

Both cities and states are flocking to Washington with demands for federal funds to help pay for this or that, including municipal school systems! Hungry people everywhere are looking to the United States to help solve the problems of food, disease, sanitation, and clothing. While here at home, everyone who pays taxes wants a tax cut. The big search is on for Aladdin and his magic lamp and genii who can show us how to get rich without working. Another job for the genial genii is to tell us how we are going to reduce the national debt of *over a quarter of a trillion dollars*—without saving.

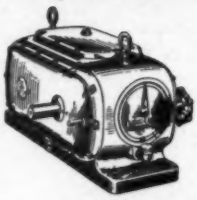
Labor has turned out to be a pretty good sized "gimme" guy, too. Not only an ever-spiraling pay check, but currently they are wanting so-called "portal-to-portal" pay. They are just pikers in their demands that they be paid for walking time from the factory gate to the punch press. . . . Why not be far-sighted about it and demand payment for the time of traveling from the portal of the worker's own home and back again? Surely the time spent in commuting back and forth from home to the factory is just as valuable as the walking time from factory gate to the beater or the digester.

What would Benjamin Franklin and his thrift think about the free spending Townsendites? Why should a company manufacture potato diggers if the farmers get paid for destroying crops. What is the use of working if we can get the Government to support us, and in a manner to which we are entirely unaccustomed?

If we are going to keep away from a nation-destroying and government-obliterating depression we, as a united nation, had better get back to fundamentals, both in thinking and in doing. As a nation we are in the hole $260,000,000,000 deep—and we won't be out of danger until it is paid. Let's do something about working, instead of merely talking about it.

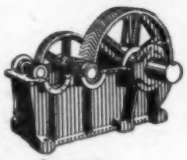
LINK-BELT *At the Service of All Industry*

THE MOST COMPLETE LINE OF MECHANICAL POWER TRANSMISSION MACHINERY



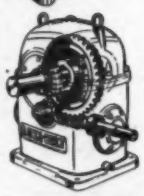
P.I.V. Gear Speed Changer

Permits infinite variation of speed while machine is running; holds set speed indefinitely, without slip or creep. All metal, wholly enclosed. ½ to 15 h.p. vertical, horizontal, plain, motorized or with extra reduction gears. Book 1874 tells all!



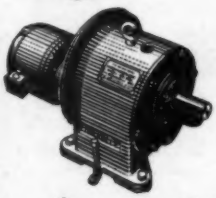
Herringbone Gear Speed Reducer

For low and medium speeds, heavy-duty applications where large reductions and shock loads are encountered. Single, double and triple reductions. Complete details in Data Book 1519-A.



Worm Gear Speed Reducer

Suited to high ratio reductions, with vertical or horizontal output shafts. Quiet, smooth operation, compact, simple and flexible, adaptable to many applications. Details in Book 1824.

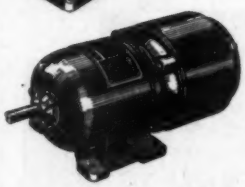


Motorized Helical Gear Speed Reducer

Simple, compact, self-contained power units for medium speed applications from 1 to 75 h.p. Details and application data in Book 1515-A.

Fan Cooled Worm Gear Speed Reducer

Delivers equivalent horsepower of a much larger unit, because cooled by internal fan. Permits more compact design and assures lower cost per transmitted horsepower. Send for details.



Electrofluid Drive

Combined standard induction motor with hydraulic coupling, for smooth starting—protecting motor and driven machine against shock load. Size of motor is based on running h.p., not on starting requirements. 1 to 20 h.p. Send for Book 2085.

A Link-Belt power transmission engineer has no one's ax to grind—except his customer's. Not confined by a limited line—he can recommend the type of speed reducer—the type of bearing—the type of chain drive—the exact power transmission units best suited to his customer's needs. Link-Belt engineering advice on your power transmission problems is completely unbiased. There is no reason for it to be otherwise.

Silent Chain Drive

Gives positive, flexible transmission without slip at high speeds. Runs slack on short centers. Usually lowest cost installation; always lowest yearly cost. Unaffected by climatic conditions or periodic idleness. Ask for Data Book 125.

Roller Chain Drive

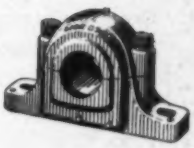
For transmitting power at high or low speeds, coordinating rotation of numerous shafts, in either direction; for short or long centers; runs slack and is unaffected by temperature or moisture. Details in Book 1957. Single or multiple widths.

Steel, Promal and Malleable Chain Drives

For slow and medium speeds or where extraordinary strength is needed, L-B Steel, Promal and Malleable Iron chains are the standard by which performance is gauged. Standard types have been developed to meet various services. Data Book 1994.

Ball Bearing Mounted Units

Light and medium duty series, pillow blocks with solid or split housings, and flanged, cartridge or take-up units, self-aligning and fixed or floating types. Full details in Book 2094.



Roller Bearing Mounted Units

For heavy-duty service, made in split housing pillow blocks. Self-aligning, for fixed or floating shafts, and press fit or adapter type. Full data in Book 2095.

Unmounted Ball and Roller Bearings

Provide self-alignment for radial, thrust, or combinations of radial-thrust loads for all degrees of misalignment. Offer great economy of application. Details in Books 2094 and 2095.

Babbitted Bearings

In a complete line including the widest selection of types of solid and split housings, grease lubricated or self-oiling, for light and heavy service. Popular types and sizes in stock. Data in Book 1997.

LINK-BELT COMPANY

The Leading Manufacturer of Conveying and Mechanical Power Transmission Machinery

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices, Factory Branch Stores and Distributors in Principal Cities. 10.552

to simplify your choice of plasticizers

You will find a preliminary basis for the selection of Monsanto Plasticizers in the cross-reference table included here. Obviously this is only indicative of possible applications — Monsanto's 40-page book "Plasticizers and Resins" contains extensive information on moisture resistance, flexibility, adhesion, hardness, softening effects, permanence, fire retardence, film strength, brilliance, gloss, and other desirable properties contributed by Monsanto Plasticizers. Send for your copy. Also contact Monsanto for specific information concerning your present or prospective needs. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Mo. . . . District Offices . . . New York, Chicago, Boston, Detroit, Cleveland, Cincinnati, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle, Montreal, Toronto.

MONSANTO CHEMICALS
SERVING INDUSTRY . . . WHICH SERVES MANKIND

SUGGESTED PLASTICIZER APPLICATIONS

● Denotes: of use
■ Denotes: of special value

	Aroclors	Dibutyl Phthalate	Diethyl Phthalate	Dimethyl Phthalate	HB-40	Ortho-Nitrobiphenyl	Santicizer 3	Santicizer 8	Santicizer 9	Santicizer 10	Santicizer B-16	Santicizer E-15	Santicizer M-17	Santicizer 140	Santicizer 160	Triphenyl Phosphate	Tricresyl Phosphate
Acrylates			■									■	●	●		■	
Alkyds		■	■									●	●	■			■
Benzyl Cellulose	●					●						■	■				
Buna N		■	■				●					●	■	■	●		■
Cellulose Acetate				■	■		■	●	●		●		■	■	●		■
Cellulose Acetobutyrate		■	●				●	●	●	■	■	●	●	●	●	●	●
Cellulose Acetopropionate		■	■	●	●		●	●	●		■	■	●	●	●	●	■
Cellulose Nitrate	●	■	■				■	■	■	■	●	■	■	■	●	■	■
Chlorinated Rubber	■	■	●				●					●	●	●			●
Ethyl Cellulose	●	●	●	■		■	■	●	●	■	■	●	●	●	●	■	●
Melamine-Formaldehyde										■	■	■					
Phenol-Formaldehyde										■				●			●
Polyamide								●	■	■	■				●		
Polyvinyl Acetate	●	●	●				●	■	■	■	■	●	●	●	■	●	●
Polyvinyl Butyral	■	■	●				●				■	■	■	■	●	■	
Polyvinyl Chloride	●	●	●			●	●				■	●	●	■	■	■	■
Polyvinyl Chloride-Acetate	●	■	■			●	●				■	●	●	■	■	■	■
Polyvinyl Formal				■			●	■	●		■		●	●			■
Polystyrene	●	●	●			●	●	■	■		●	■	■	■		■	●
Santolites	■	■	●	■			■	●	●	■	■	●	●	●	●		■
Shellac		■	■	■			■	●	●		●	■	■				
Urea-Formaldehyde								●	●		●						
Zein								●	●	■							

Again- RELIANCE MOTORS

help Weyerhaeuser achieve faster, more efficient log barking and chipping!

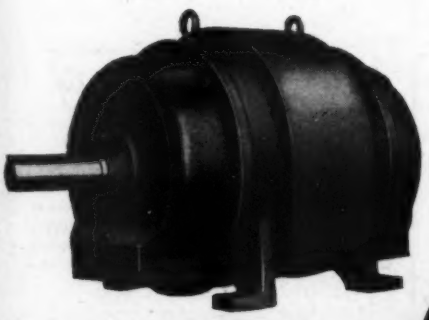
On their way into the chipper, logs are regulated in their progress over spiked rolls through each roll's independently operated Reliance Splash-proof Gearmotor. Logs can be quickly started, stopped, positioned or reversed as the operator sees fit through automatic control.

In the hydraulic barker, whole logs are turned continuously by a Reliance Adjustable-speed Motor and a differential reduction gear.

In 1943, the pulp and paper industry learned of the vital part played by Reliance Motors in the amazing efficiencies and economies introduced by the Weyerhaeuser hydraulic log barker and chipper at Everett—largest in the world. Now, Weyerhaeuser again makes news—with even faster, more efficient hydraulic processing of whole logs at Longview. And here, again, it's Reliance Motors supplying the power to make new records possible!

Each of the rugged, dependable motors Reliance sent to this job is designed to meet the speed and torque requirements of the operation involved. Those which power the barker are fully protected against water spray and bark. All are adapted to remote control and split-second timing.

Here is more evidence of Reliance's ability to produce integrated, co-ordinated drives, complete with motors, brakes, reducers and controls, and designed—both electrically and mechanically—to meet the requirements of a job exactly. Drives planned this way mean greater speed, higher production, easier operation.



Splash-proof Reliance A-c. Motors operate door and entry chains, lift skids, lift arms and positioning knees. A single operator maintains finger-tip control of the log from the Reliance-Clark bench board.

RELIANCE ELECTRIC & ENGINEERING CO.

1078 Ivanhoe Road **Cleveland 10, Ohio**

Sales Representatives in Principal Cities

RELIANCE A-C D-C MOTORS

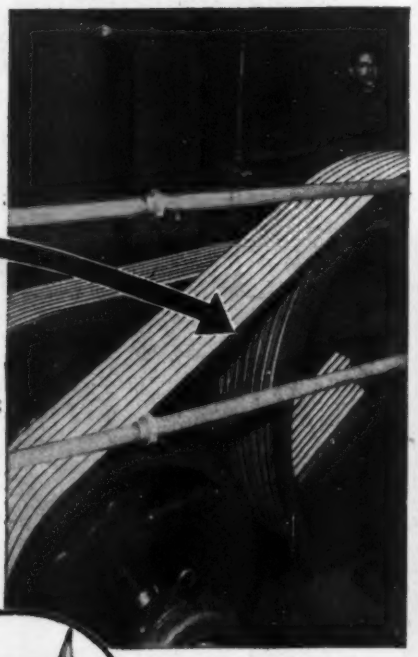
"Motor-Drive is More Than Power"

You See at Once That the

SIDE of a V-BELT

is the part that GETS the WEAR

DIAGRAM OF V-BELT IN SHEAVE



Naturally so, because the sides of a V-belt do all the gripping on the pulley. They get all the wear against the sheave groove wall.

It's the sides, too, that pick up all the power delivered by the driver pulley. The sides transmit that power to the belt as a whole. And then, once more, it's the sides--and the sides alone--that grip the driven pulley and deliver the power to it.

That is why you have always noticed that the sidewall of the ordinary V-Belt is the part that wears out first.

---and Now See How the

CONCAVE SIDE

(A GATES PATENT)

✓ REDUCES Sidewall WEAR

Greatly Lengthening Belt Life!

Clearly, since the sidewall is the part that wears out first, anything that prolongs the life of the sidewall will lengthen the life of the belt.

The simple diagrams on the right show exactly why the ordinary, straight-sided V-Belt gets excessive wear along the middle of the sides. They show also why the Patented Concave Side greatly reduces sidewall wear in Gates Vulco Ropes. That is the simple reason why your Gates Vulco Ropes are giving you so much longer service than any straight-sided V-Belts can possibly give.

✓MORE Important NOW Than ever Before!

Now that Gates Specialized Research has resulted in V-Belts having much stronger tension members -- tension members of Rayon Cords and Flexible Steel Cables, among others--the sidewall of the belt is often called upon to transmit to the pulley much heavier loads. Naturally, with heavier loading on the sidewall the life-prolonging Concave Side is more important today than ever before!

THE GATES RUBBER COMPANY, DENVER, U. S. A.
World's Largest Makers of V-Belts

Straight Sided V-Belt

How Straight Sided V-Belt Bulges When Bending Around Its Pulley

You can actually feel the bulging of a straight-sided V-Belt by holding the sides between your finger and thumb and then bending the belt. Naturally, this bulging produces excessive wear along the middle of the sidewall as indicated by arrows.

Gates V-Belt with Patented Concave Sidewall

Showing How Concave Side of Gates V-Belt Straightens to Make Perfect Fit in Sheave Groove When Belt Is Bending Over Pulley

No Bulging against the sides of the sheave groove means that sidewall wear is evenly distributed over the full width of the sidewall—and that means much longer life for the belt!

472

GATES VULCO ROPE DRIVES

Engineering Offices IN ALL INDUSTRIAL CENTERS of the U. S. and 71 Foreign Countries

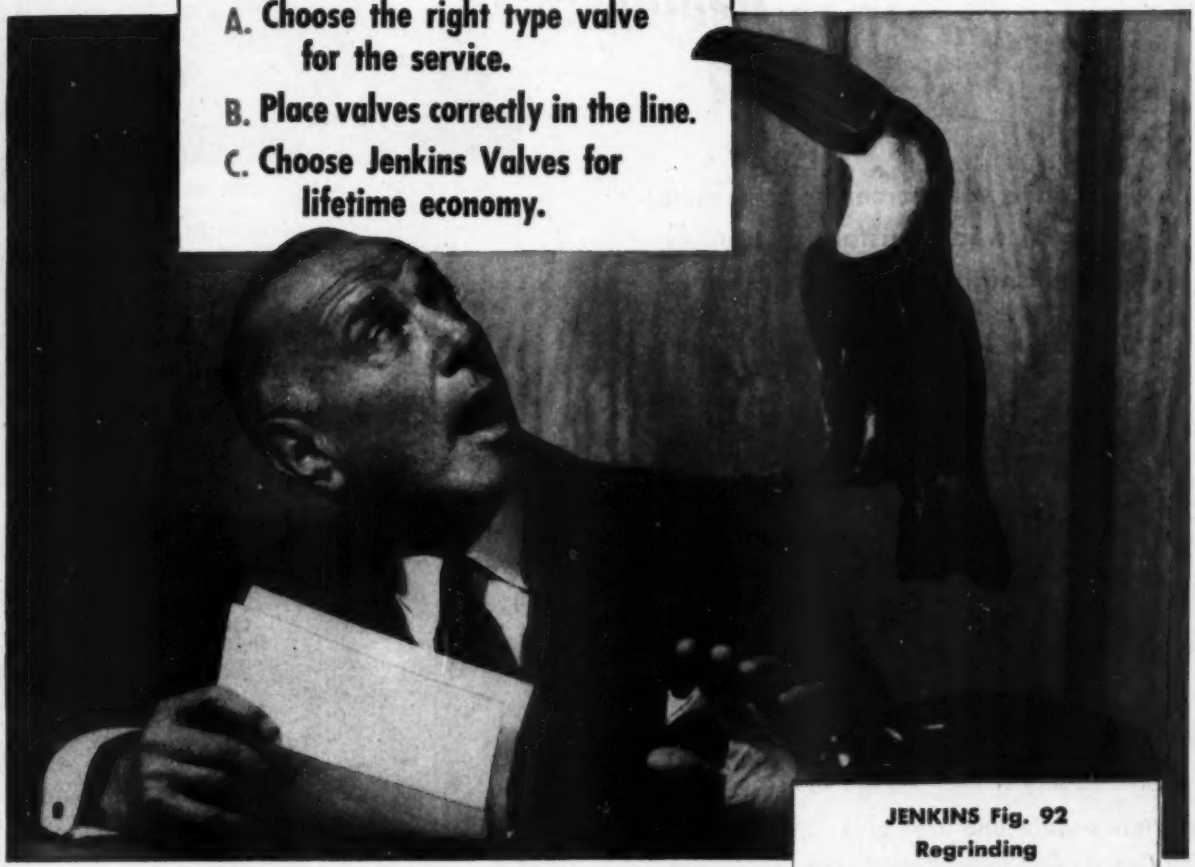
Gates

It's Simple to avoid a Big Bill for valve upkeep!

A. Choose the right type valve for the service.

B. Place valves correctly in the line.

C. Choose Jenkins Valves for lifetime economy.



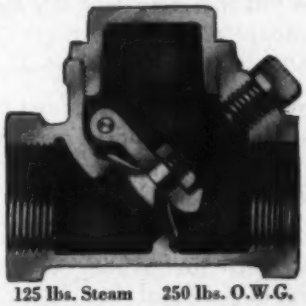
THESE three, simple, basic rules, plus intelligent treatment and care of valves, are paying extra dividends in valve economy to more and more valve users in every industry.

By choosing Jenkins Valves, you get not only valves made with extra endurance that means extra economy, but also expert advice of top-rated valve specialists, Jenkins engineers, on any question of valve selection or placement for any service.

Base your valve buying on this ABC formula for *lowest cost in the long run.*

Jenkins Bros., 80 White Street, New York 13; Bridgeport; Atlanta; Boston; Philadelphia; Chicago; San Francisco. Jenkins Bros., Ltd., Montreal.

JENKINS Fig. 92
Regrinding
BRONZE SWING CHECK VALVE



125 lbs. Steam 250 lbs. O.W.G.

Designed for service on non-return control systems; especially with Gate Valves, where a comparable full, free flow of steam, oil, water, or gas is required. It is also widely used for condensate and return lines. The high tensile bronze disc is carefully machined to a smooth, tight-fitting finish, can be reground easily without removing valve from line.

ONE OF OVER 600 *EXTRA VALUE* VALVES MADE BY JENKINS *VALVE SPECIALISTS*

LOOK FOR THIS DIAMOND MARK

SINCE 1864

JENKINS VALVES

Types, Sizes, Pressures, Metals for Every Need

Sold Through Reliable Industrial Distributors Everywhere

A good way to CUT DOWN Screen Plate Replacement

RESISTS WEAR AND CORROSION. Centrifugal pulp screen of perforated Monel plate, fabricated by *Hendrick Mfg. Co.*, Carbondale, Pa., of 18 U. S. gauge Monel sheet with 0.062" perforations. *(Photo courtesy of Trimbey Machine Works, Glens Falls, N. Y.)*

Make your screens of the metal with wear resistance, strength and high fatigue properties

What metal is that?

***Monel**:*

Used in centrifugal pulp screens operating on chemical and ground wood pulps, perforated Monel plates frequently outlast other screen plate materials two or three times.

Why?

Because Monel—like all high Nickel Alloys—is strong and tough. It's rustproof. It resists corrosion caused by acid and alkaline stocks and solutions.

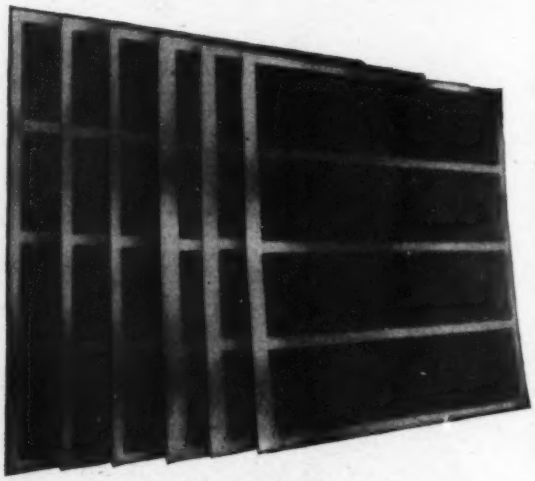
Furthermore, Monel has high fatigue strength. It withstands wear and abrasion. Its perforations remain smooth; they retain their size and shape.

Here's what one user says:

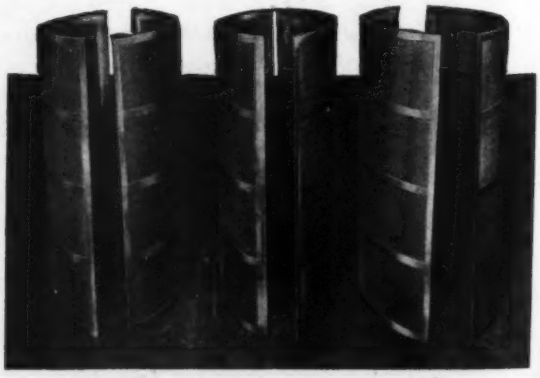
"Other plates wear from 0.058 in. to 0.065 in. in less than 150 operating days. *We have records of a number of Monel plates which have . . . increased only from 0.060 in. to 0.064 in. in 500 days."*

Monel screens are perforated from cold-rolled Monel sheets having an approximate hardness of 130 Brinell. Perforations can be as small as 0.045 in. in diameter . . . or as large as one inch.

For your next screens, give Monel a trial . . . and see how much longer they last, how much better they serve, in *your* mill!



READILY FABRICATED. Although Monel is strong and tough and hard, it is easy to work with. These plates have 0.060" perforations on 7/64" centers. Plates are curved after perforating, as shown below.

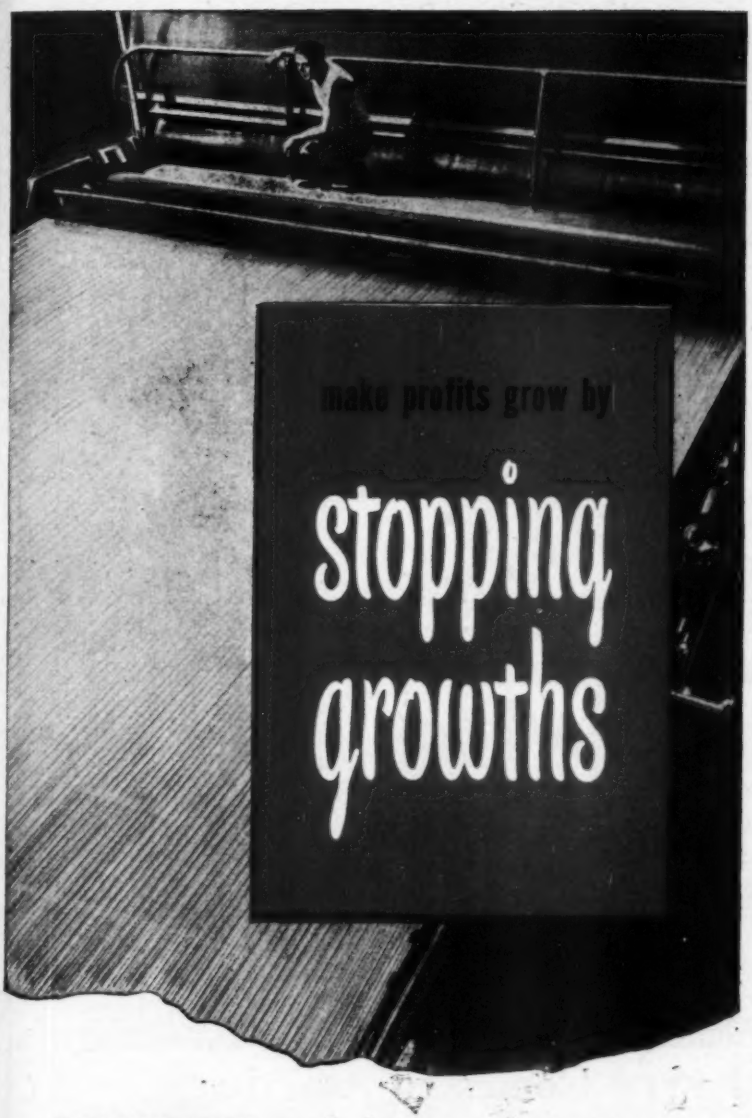


THESE ARE THE SIX MONEL PLATES pictured above. They've been curved, and are now ready for use in Quiller pulp screens. *(Fabricator: Chas. Mundt & Sons, 55 Fairmount Avenue, Jersey City, N. J.)*

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

Monel® NICKEL (INCO) ALLOYS

MONEL®• "K"® MONEL • "S"® MONEL • "R"® MONEL • "KR"® MONEL • INCONEL®• NICKEL • "L"® NICKEL • "Z"® NICKEL
®Reg. U. S. Pat. Off.



DOWICIDES curb losses of paper

In paper manufacturing—and in other industries where micro-organisms damage materials and decrease output—Dowicides turn losses into profits.

In paper mills, slime flourishes. And slime damage is expensive. Slime causes machine "breaks," defective paper due to spots and holes, and excessive wash-up time.

Conditions fostering slime growth vary. So do organisms causing slime—algae, fungi and bacteria. Control calls for careful analysis of slime types and application of proper killing agents.

Because of their broad effectiveness, Dowicides are widely used in slime control. They cut losses, too, by prolonging wet felt life, preserving adhesives and preventing mildew on lap stock. And they make paper, boxboard and fiber board mold-resistant.

In paint, textiles, lumber, leather—wherever mold, termites or bacteria attack—ask Dow to select a Dowicide for your specific use.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit
Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Ontario

CHEMICAL COMMENTS

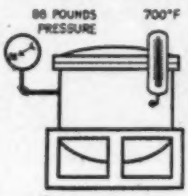
An Effective Thickener for Improved Dye Printing

Methocel, Dow cellulose derivative, has demonstrated unusual possibilities as a dispersing, thickening, and binding agent. One of its important applications is in textile printing. As a thickener for fast color salts and diazotized bases for printing on naphthol prepared grounds, it yields prints of exceptional brightness, smoothness, and sharpness of mark with greater penetration and efficiency of dyestuff. Methocel can be used in dyes either for machine or screen printing.

Coating Fabrics for Chemical Resistance

Saran F-122 Latex, a new Dow material for the textile industry, is used as a coating, sizing, impregnating and laminating agent in the treatment of fabrics. Coated with Saran Latex, fabrics are particularly well suited for industrial use where chemical resistance and durability are important. They can be made resistant to water, oils, greases, gasoline, acids and alkalies in the making of conveyor belting, tarpaulins and other products. Yarn and thread can also be sized with Saran Latex, making them waterproof and resistant to picking and linting.

Flexible Heat for Paint Processing



Flexible heating systems are a necessity to many paint and varnish firms, where high-temperature processing requirements vary widely. In one Midwest varnish plant, where processing temperature requirements vary from simple heating to complex sequences of heating and cooling, Dowtherm, the high-temperature, low-pressure heat transfer medium, has been installed. With this indirect heating system temperatures can be adjusted easily for every specific job. The company uses a 3,000,000 btu/hr. Dowtherm vaporizer for heating and an independent liquid-phase Dowtherm cycle for cooling. Simple controls permit the two cycles to be coordinated for a variety of temperature combinations.

DOW
CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE

A New Industry Comes to America

In the late 1860's, with newer, better, faster machines, and with plentiful wood pulp in prospect to feed them, the paper industry boomed. Still the essential papermakers' felts were largely imported from England. Pioneers set about to supply the urgent need—American-made felts for America's multiplying paper mills.

Among the first of the American felt-weaving mills was one now known as F. C. Huyck & Sons. Established in 1870 in the village of Rensselaerville, New York, it has grown to be the largest manufacturer of papermakers' felts in the world. It has cooperated closely with the papermakers, designing and producing felts to run at greater speeds, remove water in greater volume, provide new finishes for new types of paper. This is its continuing purpose: to meet the most exacting needs of the vital paper industry.

The dramatic story of paper is told in the sound-and-color film, "Paper— Pacemaker of Progress," and in a book under the same title. Both are presented by F. C. Huyck & Sons as a tribute to the Paper Industry. The book will be sent free upon request.

F. C. HUYCK & SONS · *Kenwood Mills* · ALBANY, NEW YORK

KENWOOD WOOL PRODUCTS

HUYCK *Felts*

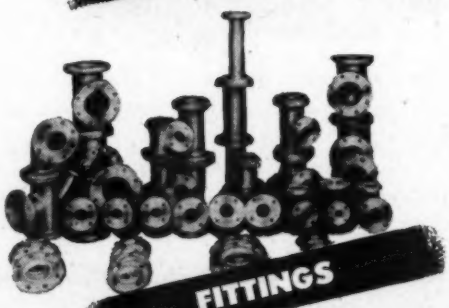
RESIST

CORROSION · ABRASION · HEAT

in the Paper Mill

with COOPER STAINLESS STEEL · · ·

CASTINGS



FITTINGS

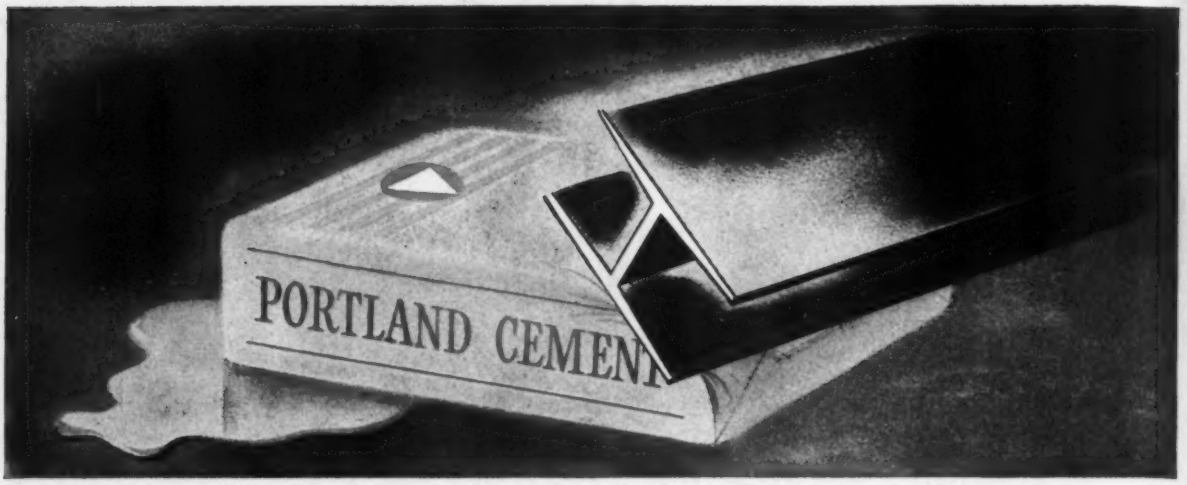
CENTRIFUGAL PIPE

COOPER'S 25 Years of close association with the Paper Industry and its intimate knowledge of the problems peculiar to that industry . . . plus vast technical experience combined with practical shop skill has resulted in COOPER'S unusual ability to produce sound corrosion resisting Stainless Steel castings, fittings and centrifugal pipe specifically designed to resist corrosion, abrasion and heat in the Paper Mill.

Each step in the production of COOPER Stainless Steel products is fully controlled . . . for all facilities and services at COOPER are located under one roof making The Cooper Alloy Foundry Co. the largest of its kind in the country.

THE COOPER ALLOY FOUNDRY CO.

HILLSIDE, NEW JERSEY



P-426 BECKAMINE

puts super-strength in paper packaging

Play safe with customer goodwill—use P-426 Beckamine in papers which may have to meet dampness or stress. This exceptionally stable urea-formaldehyde resin not only greatly increases wet-strength; it also heightens tensile strength, fold and mullen.

It's easily fitted to your production plan, too, for it can be applied in the beater, in the fan pump, or directly to the sheet at the size press. For detailed information on P-426 Beckamine write direct to the Sales Department in Detroit.

REICHHOLD CHEMICALS, INC.

General Offices and Main Plant, Detroit 20, Michigan

Other Plants: Brooklyn, New York • Elizabeth, New Jersey • South San Francisco, California • Seattle, Washington • Tuscaloosa, Alabama
Liverpool, England • Paris, France • Sydney, Australia • Zurich, Switzerland • Milan, Italy • Rio de Janeiro, Brazil

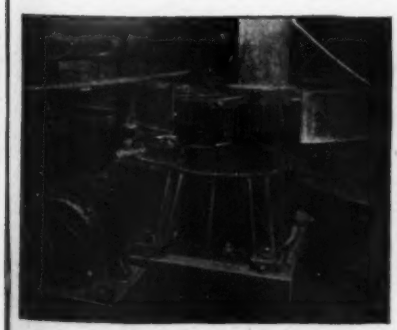
SYNTHETIC RESINS • CHEMICAL COLORS • PHENOLIC PLASTICS • INDUSTRIAL CHEMICALS

Jones WORM-HELICAL SPEED REDUCERS

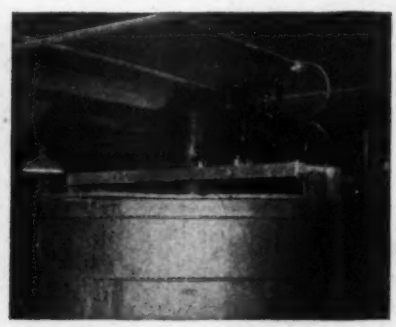
-for Vertical Shaft Drives

THESE machines fill a long felt need for double reduction units of the fully enclosed type to be used for agitators, mixers, ore roasters, bending rolls, etc., requiring a vertical shaft drive. Built in standard ratios in various types of assemblies ranging from 40 to 1 to 250 to 1 for all common motor speeds and a wide range of horsepower ratings.

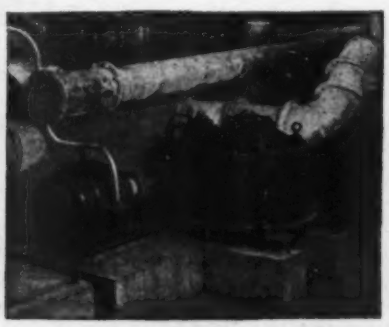
Jones Bulletin No. 75 covers complete details on these Worm-Helical Speed Reducers, with rating tables, dimension diagrams, torque charts and other application information. We shall be pleased to send you a copy.



• Jones Worm-Helical Speed Reducer on ore roaster with section of dust guard removed to show final gear reduction.



• Jones Worm-Helical Speed Reducer driving a lacquer agitator. A simple design prevents leakage of oil along the vertical low speed shaft.



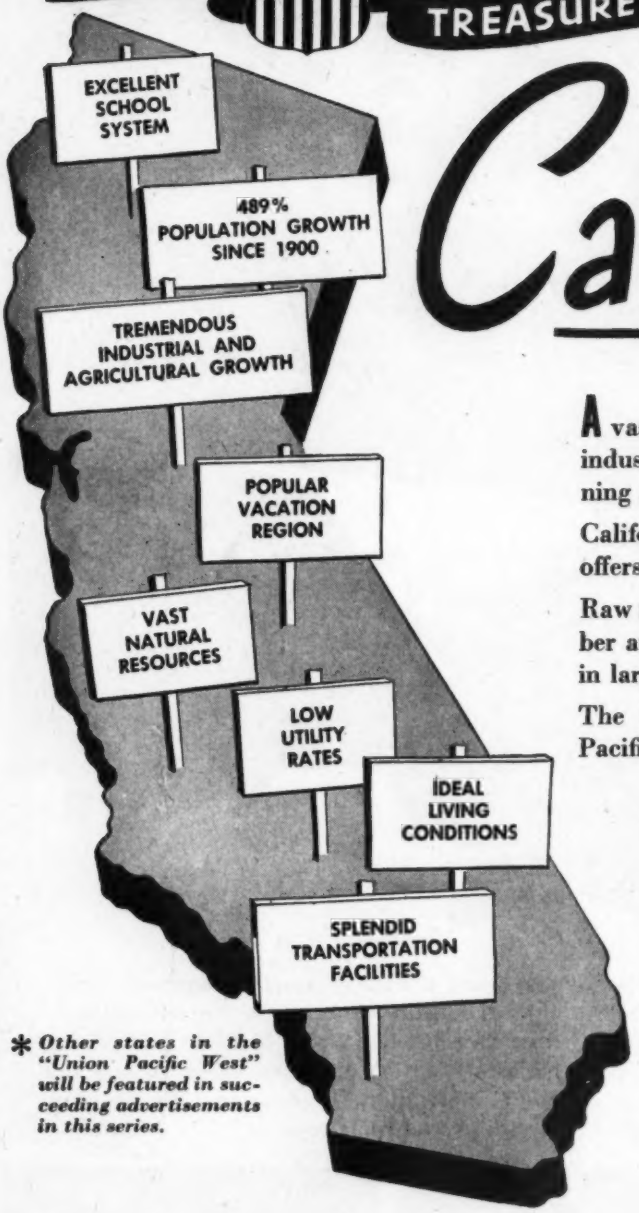
• Jones Worm-Helical Speed Reducer on a paper mill agitator drive.

W. A. JONES FOUNDRY & MACHINE CO., 4439 Roosevelt Road, Chicago 24, Illinois

UNION PACIFIC

TREASURE MAP OF INDUSTRY

California *



A vast opportunity for development awaits industrial and commercial concerns planning a west coast location.

California's population, steadily increasing, offers a tremendous easy-to-reach market.

Raw materials . . . minerals, petroleum, lumber and agricultural products are available in large quantities.

The Golden State is ideally located for Pacific export trade.

Hydro-electric power, nearby natural gas and oil fields, a mild all-year climate are industrial advantages.

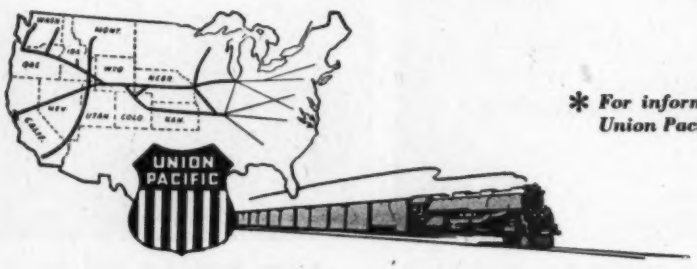
Freight transportation facilities are unsurpassed. California is one of eleven western states served by the Union Pacific Railroad.

For industrial expansion, consider California. For dependable, all-weather transportation, to or from the West, we suggest—

be Specific – say "Union Pacific"

* *Other states in the "Union Pacific West" will be featured in succeeding advertisements in this series.*

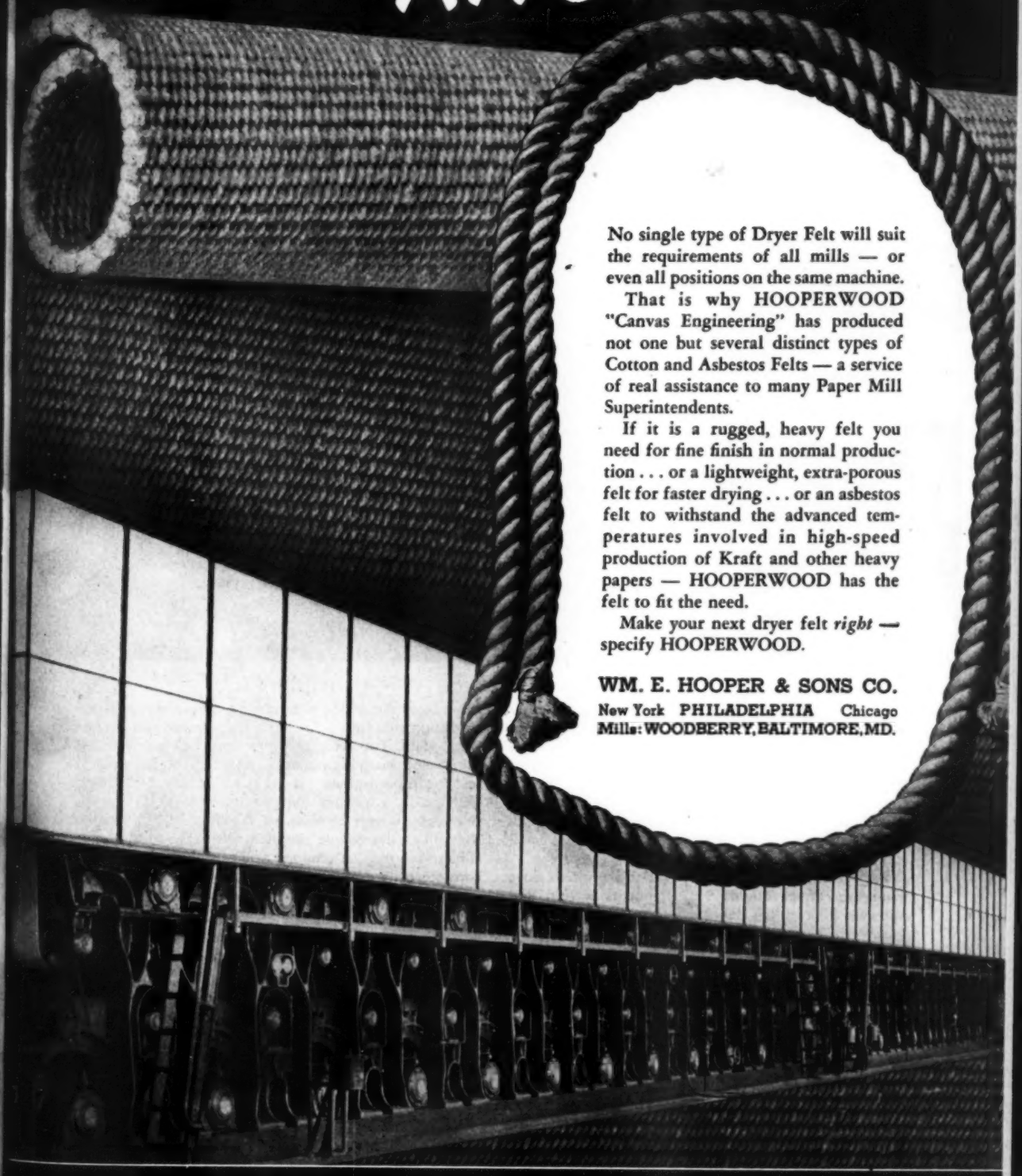
* *For information address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska.*



UNION PACIFIC RAILROAD

THE STRATEGIC MIDDLE ROUTE

WHAT EVERY PAPER MAKER KNOWS...



No single type of Dryer Felt will suit the requirements of all mills — or even all positions on the same machine.

That is why HOOPERWOOD "Canvas Engineering" has produced not one but several distinct types of Cotton and Asbestos Felts — a service of real assistance to many Paper Mill Superintendents.

If it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an asbestos felt to withstand the advanced temperatures involved in high-speed production of Kraft and other heavy papers — HOOPERWOOD has the felt to fit the need.

Make your next dryer felt *right* — specify HOOPERWOOD.

WM. E. HOOPER & SONS CO.

New York **PHILADELPHIA** Chicago

Mills: WOODBERRY, BALTIMORE, MD.

HOOPERWOOD DRYER FELTS

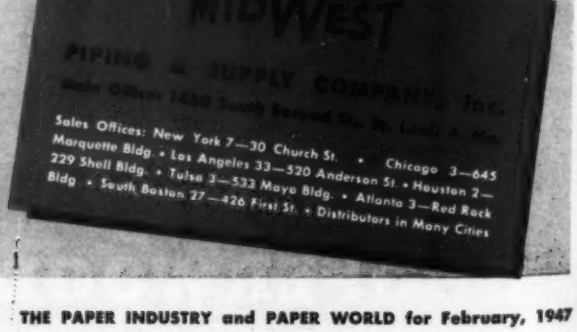
COTTON AND ASBESTOS

MIDWEST PIPE FABRICATING PLANTS Make a CONTINUOUS CHECK on the HIGH QUALITY of MIDWEST WELDING FITTINGS

Four modern Midwest pipe fabricating plants supply piping for all purposes and pressures to a great variety of industries from coast to coast. These Midwest plants are large users of Midwest Welding Fittings. This regular everyday use of these fittings in fabricating both simple and complex piping subassemblies provides an accurate and continuous check of their quality . . . of correct dimensions . . . of uniformity . . . of accurate angularity, etc.

But this daily use in our own fabricating plants does more than check quality . . . it makes certain that Midwest Fittings are thoroughly practical . . . that they meet the needs of modern piping practices from a design standpoint . . . that they are easy to lay out and weld. For example: the accuracy of Midwest machining methods makes it possible for the user to cut his pipe before receiving his Midwest Welding Fittings . . . he can depend upon the catalog dimensions. Buyers of Midwest Welding Fittings get the benefit of this unique situation. We sell you the same fittings we use . . . assuring you of quality fittings that are correctly designed and that save time and money on many different kinds of piping jobs. Bulletin WF-41 gives all the facts; ask for a copy.

MIDWEST WELDING FITTINGS IMPROVE DESIGN AND REDUCE PIPING COSTS


MIDWEST
PIPING & SUPPLY COMPANY, Inc.
Sales Offices: New York 7—30 Church St. • Chicago 3—645 Marquette Bldg. • Los Angeles 33—520 Anderson St. • Houston 2—229 Shell Bldg. • Tulsa 3—533 Mayo Bldg. • Atlanta 3—Red Rock Bldg. • South Boston 27—426 First St. • Distributors in Many Cities

THE PAPER INDUSTRY
and PAPER WORLD

FEBRUARY, 1947

Pulp and Paper Outlook for 1947*

▶▶▶ PRODUCTION IN THE pulp and paper industry during 1946 was maintained under highly favorable operating conditions and it is believed these conditions will prevail in 1947. In general, field reports state, there will be no significant curtailment in production as a result of shortages of raw materials, labor, or other necessary items of production. Rather it is anticipated that production will rise because of an increase in raw material supplies, a more adequate supply of labor, increased labor efficiency, and most important of all, a further increase in the production capacity of the industry. In 1946, the industry operated close to 100 per cent of six-day capacity. By the end of 1947, capacity may be around 1½ to 2 million tons greater than on January 1, 1946, as a result of new plant and machinery installations planned by the industry.

With these additional new facilities and improvement in operation, the industry's 1947 volume of paper and paperboard production is expected to increase by about 5 per cent. In the case of wood pulp, it is anticipated that the paper and paperboard mills' increased demand for pulp will be satisfied through increased domestic production, substantial additional pulp from newly installed Canadian production operated by United States companies, as well as larger supplies of imported market pulp. It is anticipated that there also will be a further increase in the utilization of waste fibrous materials throughout 1947.

Prices

According to the field office reports, the industry as a whole anticipates a rise in average selling prices on the various items produced, amounting to from 5 to 10 per cent in 1947. This anticipated rise is dependent on general price movements and is much below the 72 per cent increase in prices which followed in the second year after World War I. However, many present economic factors and industrial conditions are far different than following World War I and, in general, there does not seem to be a basis for a continued sharp rise in prices in 1947.

Paper and paperboard in the United States are expected to remain in short supply for an indefinite period, and mills are planning to continue allocation to customers through the first quarter of 1947 at least. As mills increase output, they are increasing allocations to established customers and in many instances are taking on new customers, especially those whose new developments seem to offer a sustained long-range market. Following the end of OPA on November 9, some mills adopted a policy of raising prices slowly and moderately so as to eventually determine their cost-price relationships; in other instances, some mills raised prices in "one bite" from 5 to 10 per cent, apparently believing that would be less obtrusive to customers than a gradual rise over a period of weeks.

Pulpwood

Woods labor is expected to be generally in adequate supply and, while it is not possible to forecast labor relations for any future period, no serious work disturbances on a large scale are evident at present. A recent upward revision of wages in the north central part of the country may be a harbinger of wage adjustments in other pulpwood regions. Inevitable increases in operating costs in 1947 are the basis for an expected upswing in pulpwood prices, estimated as high as 15 per cent.

Definite relief in 1947 of the railroad car shortage is not in sight at the moment. Some improvement should develop within the next 12 months, and increased supplies of motor trucks during this period should help to fill transportation needs. Other mechanical equipment, and parts, should be available in growing quantities for cutting and transporting pulpwood in 1947. The efforts of equipment manufacturers to achieve greater adaptability of their products to the peculiar hazards and rigors of the pulpwood industry should contribute to a more widespread and efficient use of mechanical equipment in the woods and a resultant increase in the productivity of woods workers.

Finally, pulpwood procurement should be stimulated by the constructive programs of trade organizations, associations, and government agencies having as their objectives improvement and adoption of forest practices and accepted methods of conservation.

Imports of pulpwood from Canada, which furnish approximately 10 per cent of total United States pulpwood supplies, are an uncertain factor in the supply situation for the forthcoming year. A tentative 1947 basic quota of 1,250,000 cords for the United States has been set by Canadian authorities, with the expectancy that this figure will be increased by a supplemental quota to be authorized in the early summer of 1947 provided Canadian supplies at that time permit an increase in the United States allotment. This arrangement renders it very problematical that 1947 imports from Canada can equal the receipts for the current year, estimated at around 1,985,000 cords on the basis of 10 months figures. Moreover, growing

(*) Condensation of report prepared by Pulp and Paper Unit, Office of Domestic Commerce, Forest Products Section.

demands of Canadian pulp and paper production for pulpwood may not permit the maximum shipments possible otherwise under the above arrangement. Thus, Canada takes on a similar relationship to the United States pulpwood situation that Sweden occupies in the field of wood pulp supply. In other words, imports from Canada in 1947 approximating, or even exceeding, those for the current year, take on a special significance if United States paper and paperboard manufacturers are to meet a demand in 1947 which is expected to be even greater than the unprecedented requirements of 1946.

The possibility of labor disturbances in the Canadian pulpwood industry, at least that portion located in Ontario and the eastern Canadian provinces, is considered unlikely during the current cutting season; the last strike of bush workers in this area was settled on November 2. The area in question produces well over 80 per cent of Canadian pulpwood. Despite the note of uncertainty in the foregoing remarks on Canadian pulpwood procurement for the forthcoming year, a spokesman of that country's Government recently predicted a record year of wood pulp production in 1947. The outcome of this prophecy would require a correspondingly satisfactory production of pulpwood. The element of uncertainty would be the total allotment of pulpwood which Canada can spare the United States after its own needs are satisfied.

Wood Pulp

The new supply of wood pulp for all uses for 1947 is expected to be about 13,400,000 tons compared with 12,430,000 tons in 1946. This represents an increase of 970,000 tons or around 8 per cent greater than in 1946. Of this net increase, about 220,000 tons are expected to originate from northern European sources and the remaining 750,000 tons from domestic and Canadian production. Practically all of this additional supply, or about 84 per cent of the total increase (amounting to 810,000 tons) is expected to be in paper grade pulp, which should be reflected in increased paper and board output.

The same relative ratio of increase in 1947 paper and paperboard production over 1946 as would seem to be indicated by the 1947 new supply of paper pulp over 1946 is not expected because: In 1946, pulp was consumed from inventories amounting to about 200,000 tons in addition to new pulp supply; the ratio of wood pulp to paper and board probably will increase in 1947; namely, more pulp will be used per ton of paper and board.

Not allowing for any pulp inventory replenishment at mills during the year but permitting exports of 50,000 tons of paper-pulp plus allowance for short supplies in the first few months of 1947, should result in an estimated production of 1,000,000 tons of paper and paperboard over 1946, bringing total 1947 output to around 20,000,000 tons.

The foregoing estimates are conjectural since no specific information is available as to either overseas supplies or the amount of new domestic or Canadian pulp capacity actually completed in 1946 or to be completed in 1947. Nevertheless, these estimates reflect a consensus of an over-all appraisal and reasonable expectations.

Since no major domestic or Canadian pulpwood supply problems are anticipated for 1947, the principal criterion to pulp output in the United States will be new capacity and, to a lesser degree, higher output in relation to existing capacity as well as the reopening of a small capacity shutdown during the war. The same relative conditions apply to Canada.

However, the Scandinavian countries do not present an equally optimistic picture. While pulpwood supplies in those countries are expected to be reasonably abundant by the spring of 1947, there are other operating and distribution problems. Coal will undoubtedly remain short for the northern European countries and it now appears doubtful whether pulp output over all can be raised to much more than 60 to 70 per cent of capacity in any of the three countries. In the case of Finland particularly, it now appears that Russia may take much larger than prewar quantities while at the same time supplies will be sought by other markets. These include numerous countries which have signed bilateral trade treaties with both Finland and Sweden, with many of such treaties setting a quota on pulp allocations. Production in Norway may be slower in recuperating than in either Sweden or Finland, and demands of the Norwegian paper mills as well as domestic needs for paper may not allow much pulp being made available for export.

Wastepaper

Total wastepaper receipts in 1946 promise to establish a new record well in excess of 7 billion tons. Continuation into 1947 of the high levels attained since the spring of 1944 is believed possible. The demand for wastepaper by paper and paperboard manufacturers is expected to reach tonnages in excess of the unprecedented requirements of the current year. Increased potential wastepaper supplies due to an enlarged 1947 production of paper and board, will be available for collection. Estimates for 1947, indicate wastepaper requirements of approximately 7,700,000 tons with receipts expected to substantially exceed that figure. Barring a serious upset in paper production, these figures are believed realistic even though they do anticipate expansion of collection efforts.

With a steady mill demand that is believed capable of absorbing practically all offerings, there are several factors which encourage the belief that 1947 will be another big year for wastepaper collection. Supplies of recoverable paper will be at new levels. There is a keener and more widespread public appreciation of the significance of wastepaper and the profitable rewards of collection. Certain of the country's most productive wastepaper centers, such as New York City, are introducing improved methods and apparatus for wastepaper salvage. Industry sponsored "drives" in selected areas, following methods first inspired by emergency wartime needs, are developing techniques for stimulating and improving wastepaper collection that are available as models to all communities where the collection of wastepaper is economically advantageous. In the regions of these "drives," closer co-operation is reported between mills and dealers looking toward solutions of their mutual problems, and enabling dealers to keep informed of specific mill requirements. Another accomplishment of the campaigns is the assistance furnished to dealers to obtain baling equipment and improve their baling capacity, thus alleviating the awkward problem of storage.

Voluntary wastepaper campaigns, sponsored by organizations such as the Boy Scouts to raise money for various humanitarian purposes, will continue to make an important contribution to wastepaper collection. Mills, however, will look to wastepaper dealers as their permanent and chief source of supply, but they, in turn, will depend upon the individual or organized groups as an important source of collections.

Exports of waste amounting, during the first 10 months of 1946, to less than 0.8 per cent of total wastepaper receipts throughout the country are not expected to be a significant factor generally in the 1947 supply situation, although a moderate increase in exports may be anticipated. Of the 1946 shipments out of the country, about 20 per cent were over-issue; the remainder consisting of old newspapers and all other grades.

Rags

Any marked improvement during the forthcoming year in the present tight supply of new cotton rags will probably have to await a definite and substantial upswing in the textile industry. Meanwhile manufacturers of fine papers will continue the substitution of cotton to make up for the lack of new rags of cotton and linen. Some increase as to the prices of rags in these catagories may be expected during 1947.

Old rags, which form a substantial portion of the component materials of building papers, (the group utilizing nearly 70 per cent of the total quantity of rags consumed by the paper and board industry), may be in somewhat better supply in 1947. Whatever improvement develops will probably take place in imports, which have increased from an average of 3585 tons annually in the three years 1943-45 to a 1946 total of more than 15,000 tons, based upon figures for the first 10 months. While import statistics do not segregate old rags, the stated value indicates that the preponderance of imports are in this category.

Before the war, the United States brought in—from Europe, the Near East, Japan, Latin America, and other regions—quantities of rags that made up, in 1939 (for example), about 12 per cent of this country's total rag consumption. Total imports fell off from 122,000 tons in 1937 and 57,240 tons in 1939 to the recent annual figures already mentioned. Although imports for the five months ending with October, 1946, made up only 2½ per cent of total United States rag consumption during that period, the improvement shown by the 1946 total as compared with previous recent years, indicates that foreign shippers are again becoming an important factor in United States supply.

Newsprint

The tight supply situation in the newsprint field can be expected to continue into the second quarter of 1947 and perhaps longer. No substantial increase in newsprint supply during the first half of the coming year is in prospect. North American mills are operating at practical capacity and any increase in receipts from this source will necessarily be small and a result of increased efficiency in the operation of machines. No imports from the Scandinavian countries can be expected during the first quarter of 1947 due to ice conditions in the Baltic, which interferes with shipping. About 50,000 tons of Finnish newsprint is earmarked for shipment to the United States during the remainder of 1947.

W. LEROY NEUBRECH, who is Acting Chief of the Pulp and Paper Unit, Department of Commerce

Prospects for imports of newsprint from the other two Scandinavian countries are uncertain at this time. Production in both of these countries during 1946 was hampered by lack of sufficient quantities of pulpwood and coal and little improvement is anticipated in 1947. Such newsprint as they have had available for export has been insufficient to fully meet European requirements.

New machines which will add about 50,000 tons a year to the United States newsprint capacity are scheduled to come into operation in the third quarter of 1947, and another 100,000 tons a year may be added to our production by the end of the year.

The reopening of an idle mill in Canada toward the end of 1946 will enable that country to add about 80,000 tons to its annual production in 1947. Improvements announced by officials of two other mills will raise Canada's newsprint capacity another 40,000 tons annually but some months must elapse before the new machinery is installed. The increased production made possible through these additions will hardly be sufficient to cover the increased amount of newsprint under contract to British consumers. However, if the level of United States imports of newsprint from Canada and Newfoundland in the last few months is maintained throughout 1947, the United States may receive around 200,000 tons more from these sources in 1947 than in 1946.

Groundwood Printing, Book and Fine Papers

The demand for these papers from printers, publishers, and converters is running well ahead of production. While no notable decrease in demand is expected neither is any substantial increase in supply indicated in the immediate future. That the situation is not likely to improve much before the third quarter of 1947 is the consensus of a number of manufacturers and distributors in various parts of the country. Others even mention late in 1947 as the time when supply and demand will be in more equal balance.

Advance orders in the hands of printers for catalogues, travel literature, and direct mail advertising insures a continued heavy consumption of these papers for some months to come. Distributors of fine papers are reported to be sold out through the first quarter of 1947. Inventories in the hands of printers and publishers are unknown, but are generally reported to be low. Both converters and publishers claim their production is held up for lack of paper.

There is no immediate prospect of increased amounts of these papers coming on the market. The converting mills are hampered by shortages of market pulp and rags, which seem likely to continue for some months. Chemicals and coal are also in short supply.

Coarse Papers

The coarse paper field depends, of course, on general business conditions, but, barring unforeseen circumstances, the mills anticipate a more prosperous year than in 1946. The dollar value of sales is expected to be about 20 per cent greater because of higher prices and increased production. In particular, sales of kraft paper will be limited only by tonnage produced.

The opinion is that no improvement in the tight supply situation can be hoped for until the latter part of 1947 when new capacity comes into production.

Sanitary, Tissue, and Absorbent Papers

With anticipated larger supplies of sulphite pulp as well as ability of mills to adjust prices equitably on various grades of paper produced, it is expected that the shortages reported in 1946 in various items of sanitary and tissue paper will disappear by the second quarter of 1947. A few mills making some of these products, however, depend upon imported market wood pulp and in view of the current low supplies of such pulp, the output of these items may not improve materially until pulp shipments from Sweden are resumed next spring.

Fiberboard

The demand for all types of fiberboard continues at high levels and is expected to show no decline in 1947.

Demand for kraft board and containers is on a long-time upward trend as more manufacturers are turning to fiber containers in preference to wood and metal.

The gypsum liner situation remains a thorn in the flesh of the boxboard mills as approximately 11,000 tons per month is being allocated to gypsum board manufacturers. At its recent annual meeting the Folding Paper Box Association appointed a committee to protest to CPA against the use of gypsum board for any purpose other than veterans' housing.

Agreement among the Official (eastern), Western and Southern Railway traffic executives regarding the extension of Rule 41, of the Consolidated Freight Classification appears to be as far away as ever. The eastern group decided to reinstate Rule 41 in its prewar form effective January 1, 1947, and published a tariff on that basis. Early in December, the Western roads decided to continue the present Rule 41, with its relaxed specifications, until June 30, 1947, with the proviso that board and box manufacturers and shippers would submit definite recommendations for changes in Rule 41 by April 1, 1947. To date, December 12, the Southern Classification Committee has taken no action. Increasing confusion for manufacturers and users of fiber shipping containers will result unless agreement is reached soon on standard specifications.

Converted Products

Converters foresee increased production because of an expected easier supply of paper and board in 1947 owing to new capacity coming in. A number of new products have been developed and production is only awaiting the necessary raw materials.

Converters state that the current raw material supply situation is as bad as ever, but that qualified labor is more readily available. Prices of all materials are up including those of paper, chemicals, adhesives, etc., which items for the most part will remain in short supply at least until the second half of 1947.

Chemicals

The principal chemicals purchased by the pulp and paper industry will remain in limited supply through much of 1947. The demand for chlorine exceeds available supplies. Some new capacity may be in operation in 1947, however, thus easing the situation although not affording full relief. Soda ash is currently about 15 per cent short of meeting requirements. England, which was formerly one of the world's largest producers, is not yet back into normal production. In the United States, soda ash is expected to remain tight for at least a year. Salt cake and sodium silicates will probably be fairly adequate for most of 1947. Germany was one of the major world producers before the war, but it will be some time before that country is able to meet export demands.

Corn starch supplies will be ample in 1947 as the corn wet milling industry is grinding at 100 per cent capacity. Shipments of tapioca from the Netherlands Indies can be expected to improve in the coming year.

Supplies of casein, currently very short, are expected to show improvement during 1947, owing to a larger domestic output and increased imports from Argentina.

Rosin supplies, which have been short for some time, are expected to improve considerably after the spring of 1947 as a result of good crop expectations as well as increased output of wood rosin. Synthetic resins are encountering tremendous demands in the plastics and paint industries, and will probably continue in tight supply for most of 1947. Aluminum sulphate is expected to be adequate. Printing inks, as used by numerous paper converters as well as the printing and publishing industry, will remain tight since drying oils to a large degree are imported and no great improvement in supplies is foreseen. The pigment supply situation should continue to ease, except that for titanium dioxide, which is expected to continue short throughout 1947.

Transportation and Machinery

Continuation of the freight-car shortage, which reached its peak in November, may be expected but gradual improvement in car supply during 1947 is probable. The number of new cars on order as of November 1 was almost double that on January 1, 1946, and the rate at which new cars are being put in service is steadily increasing. There is good reason to expect that the 1946 downward trend in supply of serviceable freight cars will be halted in 1947 and may even be reversed. However, the maintenance of a high level of industrial production will require continued maximum utilization of car supply.

The supply of motor trucks is expected to be adequate and, in the absence of major strikes, to improve somewhat during 1947. Truck manufacturers are fairly well up to date on deliveries and have no appreciable backlog of unfilled orders.

Manufacturers of paper machinery have a backlog of orders amounting in several instances to nearly two years of production. The demand has so far outrun the production ability that individual manufacturers are refusing to accept additional orders. Current deliveries are six months to a year behind schedule owing to strikes in the coal and transportation industries plus shortages in the supply of certain metals. Perhaps the tightest supply is in the electrical equipment necessary for the operation of a paper mill.

Labor

As to labor, the general feeling is that a greater number of workers will be available for mill and woods operations in 1947 than in 1946. There is also a feeling that 1947 will see further improvement in workers' skill and attitude. Increased labor costs are also anticipated.

Current negotiations for wage increases in the automobile, steel, coal and textile industries will undoubtedly influence labor costs in 1947. These negotiations, if successful, could raise the general wage level for all industries. Should the general wage level rise, the rates in the pulp and paper industry will be vulnerable to further increases in 1947.

Distribution—Wholesalers Sales and Inventories

The wholesalers of paper and its products, like many other buyers and consumers of paper, paperboard, and converted products expect 1947 to bring added relief from the shortage of supplies which has existed throughout the past few years. If mill prices of finished or converted products do not get out of line, the wholesaler in most localities throughout the Nation can expect to sell nearly all the paper available. This means that even with the increase in current rates of production, all the Nation's paper and paperboard requirements will not be satisfied.

An increase in prices of paper and paperboard during 1947 is to be expected, according to trade opinion. Prices for the products of the pulp and paper industry, however, must not become too high relative to other prices. In a period when selling prices are increasing, price relationships can easily become distorted. If this should happen, the increasing costs of paper products will tend to choke off the consumers' ability to purchase such products or to purchase the products of other industries which consume paper. The current feeling is that manufacturers will control selling prices so as to assure maximum consumption.

Kimberly-Clark Research and Development Organization

H. A. ROTHCHILD, Technical Director
Kimberly-Clark Corporation

▶▶▶ THE DESCRIPTION of how a one-time manufacturing unit of Kimberly-Clark Corporation has been remodeled and converted into a modern research laboratory was carried in the December, 1946, issue of THE PAPER INDUSTRY AND PAPER WORLD. This mill was built in 1874, two years after the company started in business, and at that time had the very latest equipment for producing one and one-half tons of high quality rag printing per day. In 1885, the production of this mill was increased from one and one-half tons to twelve tons per day. From time to time, further increases and modifications were made, but, with the introduction of radically new building methods over the years, the mill gradually became out of date and finally noncompetitive.

Today this rebuilding of an out-of-use mill into a modern laboratory is a particularly significant example of the trend in modern industry, viz., the replacement of the obsolete with facilities to keep ahead of obsolescence in the future.

One of the principal tools used by industry in this fight against obsolescence is the organization and operation of scientific research. Most people are familiar with the spectacular results of scientific research which are widely publicized for popular reading, but few are familiar with the everyday work methods of arriving at these results. Research work methods, like all work methods, have been vastly improved during the last thirty years. For example, in the early 1900's, a research supervisor considered that he was of average efficiency if one out of thirteen or fourteen research projects under his supervision was successfully and profitably solved. The work methods for doing research have so improved in the last thirty years that it is now estimated that two out of three projects should be successfully and profitably solved.

Not only the efficiency of executing research projects has increased, but the number of projects undertaken and completed has increased enormously. There are today about ten times as many industrial research laboratories in the United States as existed twenty years ago. These research laboratories are turning out new manufacturing methods and products at a constantly growing rate which results in increasingly keen competition from these new products and manufacturing methods in each succeeding year. Industry's only answer to this problem which it faces is to combat technological obsolescence with technological improvements by way of more research and more efficiency in research methods.

The same urge that drives industry to build new factories, erect new machines, and revamp organizations so as to stay competitive, is now driving industry toward new research laboratories, modern equipment and modern organization to produce research results at a rate and quantity to be competitive. In short, we modernize a paper mill to make it competitive and we modernize our laboratories and organization to make them competitive.

The new Kimberly-Clark Research and Development Laboratories are organized on much the same basis as a modern mill organization. The various laboratories, such as the chemical research laboratory, the physics research laboratory, and the process development laboratory correspond to the operating departments of a mill such as the sulphite mill, the groundwood mill, and the paper mill. Servicing these operating departments are the service departments analogous to similar departments in the mill. There is an office department responsible for typing, accounting, filing, etc., and an engineering department responsible for design, construction and maintenance of pilot plant and other research equipment. Without going into more detail, the best in mill organization can be profitably duplicated in research laboratory organization—right down to safety committees and cleanup. Of course, the degree of organization depends on the size of the laboratories as it does in a mill, and good judgment must see that it is not top-heavy with service departments and yet with enough service so that highly paid scientists do not spend their time doing work that an untrained person could do as well.

Thus, the new Research and Development Laboratories of Kimberly-Clark, as described in THE PAPER INDUSTRY AND PAPER WORLD of December, were built so as to enable the scientists employed by Kimberly-Clark to be grouped in laboratories equipped with modern facilities, and supported by necessary service departments so as to get the maximum in improvement of process and products.

It has been stated that research, more than any other tool of industry deals with the future. What about the future of research itself? It is estimated that over 95 per cent of all manufacturers, even in these modern times, spend practically nothing on research. It is the author's opinion that competition will force them or their successors to start research in our generation. The more research carried on, the greater will be the number of

(Turn to page 1599)

The chemical unit in the modern research-development laboratory of the Kimberly-Clark Corporation. This is the largest single unit in the new laboratory

Notes and Observations on BEATERS - - - Part III

B. M. BAXTER
Consulting Engineer

▶▶▶ THE LARGE POWER consumption of high speed beaters of some designs is sometimes thought to be due to the great height of the tub at the rear and the elevation to which the stock must be raised. This concept is in error. The height of the rear of the tub in itself has no effect whatever on power, but the surface speed of the roll does. The stock carried by the roll in the roll pockets is traveling at a speed sufficient to be thrown upward to a height of 20 to 30 feet (1500 ft. roll speed, 19.4 ft.; 1800 ft. roll speed, 28 ft.). This energy is practically all lost by the dashing of the stock against the hood and deflector, and in the impingement of fast moving particles of stock leaving the roll pockets against stock in relatively very slow motion. The higher the hood and deflector, the more energy is used in reaching the height, less remaining to be lost on impact. The total end result is the same.

Conditions Affecting Power

An additional factor to these already mentioned as affecting power consumption is the depth of submergence of the roll in the stock when the beater is fully furnished and operating. The effect of submergence is so marked that it is a critical matter when designing a beater with the view to economy of power and to operate at some predetermined power rate.

The effect of submergence may best be illustrated by an actual case.

The beater was of the high speed type, having a face roll 65 inches in diameter by 54 inches. The tub height on the center line was 45 inches at the front end, 63 inches at the rear. Height to center of the roll was 39⅜ inches. The beater was driven by a direct current motor at 107 rpm. With stock 4 inches down in the tub at the front end, the motor took 265 amperes; at 7 inches down, 215 amperes; at 10 inches down, 200 amperes.

At 224 volts, the power consumption in electrical horsepower was 79.5, 64.5, and 60, at the respective stock depths. No change was made in roll setting. The level of the stock was reduced by dropping the washer and washing down. Some of the decrease in power consumption may have been due to increased density of the stock, but mainly to drop in level.

The corresponding *K* values to the power figures just given are: 4.42, 3.56 and 3.34 respectively. The lowest of these values is 75½ per cent of the highest.

Other readings were taken at a higher roll speed. Both sets of readings are shown graphically in Figure 10. Notable is the reduction in power from 106.5 hp. at 2020 feet roll speed and with tub full to 60 hp. at 1817 feet and with stock 10 inches down.

Another case in point is that of a prominent book mill. In this instance, the beaters were rebuilt to the high speed type very early in the initial period of conversion. The raising of the tub height was overdone. Motors of 100 hp., considered ample, were subjected to 150-hp. loads. Motor failures were frequent. The great effect in power savings of lowered stock level was noted. Stripes were painted around the fronts of the tubs to indicate a level of furnish not to be exceeded.

Excessive depth of stock at the face of the roll accomplishes nothing in beating effect. With proper design of the tub, sufficient stock can be caused to enter the roll pockets for maximum fibrage formation with only moderate submersion. Stock in roll pockets in excess of the amount needed for formation of fibrage merely absorbs energy to little or no useful end.

The effect on power of wide bar spacing may well be illustrated by an example.

The beater of Figure 12 was designed for use as a breaker of ledger stock preliminary to treatment in a cooking tank. A roll and tub on hand were used. The tub was lengthened by means of filler plates to secure the capacity required. The rear and sides of the tub were built up to accommodate the greater length and to secure travel at the consistency assumed for capacity calculations. A roll speed of 90 rpm, giving 1440 fpm, was selected.

The flybars of the roll were double-spaced, there being 36 bars in the roll filling. Further, the new bars were 7 inches wide instead of the original bar width of 6 inches. Using a power constant of 3.5, the estimated power for the beater was 44 hp. However, when furnished with 3700 pounds of stock at 5½ per cent density, and with a speed of travel of about 20 fpm, the actual power consumption, in current input, was 56 hp.

In this case, the actual power ran 27 per cent over the estimated. The increased roll speed, due to an additional two inches of diameter, accounted for 3½ per cent of the increase. The remainder of the 27 per cent may be considered as the combined effects of wider bars and wide bar spacing.

As a check on the accuracy of the original assumption of *K* as 3.5, another beater having a 60-inch by 54-inch roll, operating at 1400 feet, showed *K* as 3.4. Evidently the original estimate of power would have been about right for ordinary bar width and bar spacing. A breaker beater having a 72-inch by 54-inch roll, filled with very wide bars, used for breaking board mill filler stock, furnished a bale at a time, the roll turning 90 rpm, showed an average power consumption of 125 hp. The constant *K* for this power requirement is 8.1.

An ordinary roll of this diameter and face should require only 55 hp. at the operating speed. However, the high value of *K* in this instance was due not alone to the wide bars and wide spacing but also to the low consistency, about 3 per cent, at which the stock was circulated.

A pair of breaker beaters, driven from one motor, may be cited to emphasize the effect of consistency. Each of these beaters had a 62 inch x 54 inch roll with usual filling. They were ordinary Holland beaters except that the tubs had somewhat more draft than customary. Stock extractors were installed in the hoods, and roll speed was 2100 fpm.

The power consumption of these beaters varied greatly with stock furnish, with water flowing into the tubs at a steady rate. The variation was from about 115 hp. with stock at about 4 per cent to 150 hp. with water

TABLE 6—K Values of Beater

Condition of Beater	Horsepower Required	Roll Speed	Constant K
Roll Down	114	2020	5.18
	104.5	1770	6.18
	100	1770	5.91
Roll Down Light	79.2	1665	5.3
Roll Up	98.5	2020	4.46
	86.5	1770	5.10

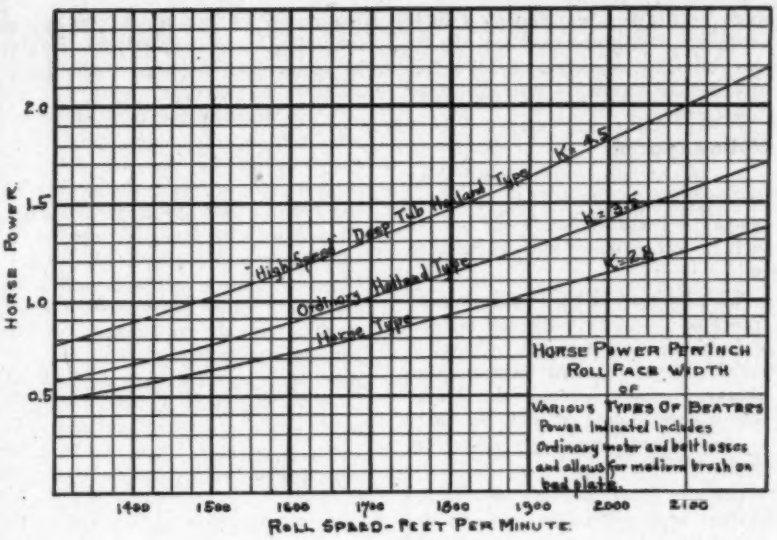


FIG 10.

only. The equivalent values of K are 2.41 and 3.15. (These beaters had no bedplates. This fact should be taken into account in any comparison of the power constants of the other studies.)

A small, special breaker beater, designed to break dry broke from a board machine, had a roll 54 inches in diameter and with a 40-inch face. The roll, filled with 31 dummy and 31 corrugated bars, was driven at 1960 fpm by a 50-hp. slip-ring, 440 volt, three-phase motor. When the breaker beater was furnished, the motor current ran 50-55 amperes. The power factor characteristics of the motor were not known. However, if the operating power factor is taken as .80, the calculated load would be 45 hp. At this figure, the value of K is 4.32.

There was nothing about the design of the beater except the wide bar spacing to indicate a value of K over 3.5. Hence, the difference between that figure and the possibly doubtful 4.32 may be ascribed to wide spacing.

Figure 11 illustrates further the effect of needlessly deep tubs. The K values of this beater, determined at several roll speeds and roll settings, are given in Table 6.

This beater, and several more like it, performed equally well as to beating time when operated at the low roll speed as at higher speeds. For that reason, the low roll speed was adopted as the permanent speed.

Weight of Rolls

The weight of a beater roll has a definite relation to character of stock to be beaten, roll speed, density of furnish, and speed of circulation. A proper weight is that which will not injure the stock when the beater is operated fully furnished with stock at normal density. This weight should be approached as nearly as possible in order to insure maximum effect.

In the consideration of these factors affecting desirable roll weight, it is apparent that with low speed of circulation, the fibrage formation on the cutting edges of the bars will be thin, the amount of fibrage supporting the roll relatively small and accordingly the pressure on individual fibers high. Also, if the roll speed is high in proportion to speed of travel, or if operating with a thin furnish, even though travel is at high rate, the same condition will result.

The effect of operating conditions may be illustrated by two practical examples.

In a mill making rope manilas, preparing stock in four Holland beaters of the same size and identical construction, the beater engineer remarked that one of these beaters was very tricky. Unless the roll of this beater was put down with great care, the stock was likely to be ruined. With the other three beaters, no especial care was needed to make good stock.

Investigation revealed that the roll speed of the tricky beater was about 1800 fpm, while the other three beaters operated at 1550 feet. The speed of travel of the four beaters showed no notable difference. It was apparent, therefore, why the action of the tricky beater differed so noticeably from the other three, for at the higher roll speed, the fibrage formation was lighter on the bar edges. Consequently, the unit pressure on the fiber was higher and the cutting action was greater.

The second example relates to a mill making bleached sulphite tissue. The beaters of this mill had very heavy rolls, each 66 inches in diameter and with a 60-inch face and, presumably weighing about 14,000 pounds. They operated at rather high roll speed, and were heavily furnished so that travel was very slow, normally 5 to 7 fpm. These beaters were of the gen-

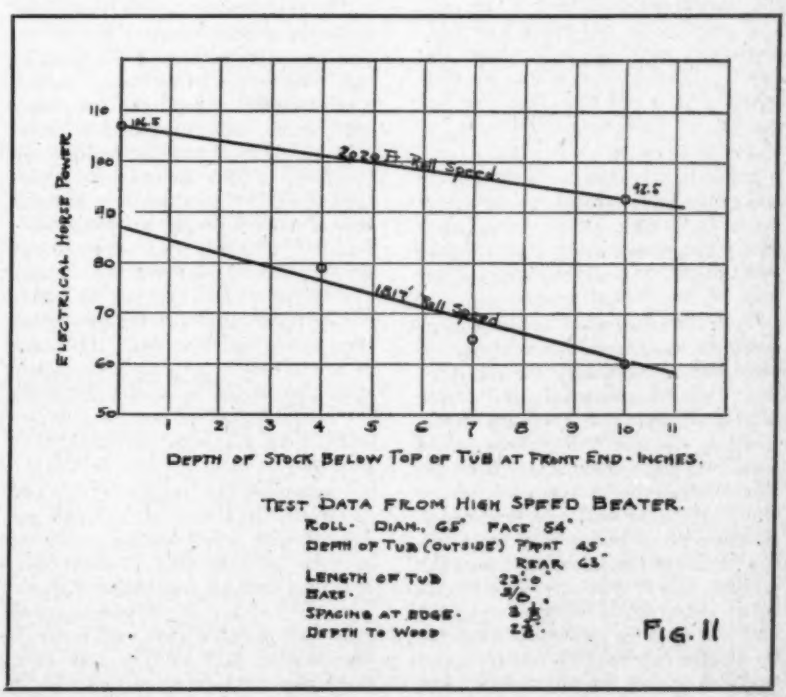


FIG. 11

eral Holland type but of a semihigh speed design. When used for making an order of very exacting specifications, there was often serious trouble in meeting strength and tear requirements.

Upon the installation of a second paper machine, essentially the same as the machine being served by the installation of beaters just mentioned, beaters were selected with especial regard to making this exacting order. These beaters had rolls 54 inches in diameter and with a 60-inch face. Each roll weighed 10,000 pounds. These beaters were operated at 6½ to 7 per cent density; roll speed was 1700 feet; travel was 25-35 fpm.

Sheet specifications were met with these beaters without difficulty. No especial care was needed in the lowering of the rolls. They did not injure the stock when the rolls were full down on the bed plates, and they beat off in about 3½ hours time as against 5 hours in the other battery of beaters. The shorter beating time may be ascribed to two things: (1) less tub capacity per inch of roll face, and (2) better tub design which by giving ample travel insured that the bars carried maximum fibrage.

Accepting the approximation to the weight of the individual roll of the first battery, the roll weight divided by roll face gives 233 pounds weight per inch of face. With inadequate fibrage and a bad combination of slow travel with high roll speed, this pressure was too much. In the second case, where good beating was obtained, the weight per inch of roll face was 167 pounds; the roll speed was moderate, and travel was more than adequate. Possibly the action of these beaters might still have been safe and quicker, at higher speed, but with loss of power efficiency.

Small beaters (other things equal) will operate safer than larger ones; because, following usual design, roll diameters increase along with roll face and tub capacity. Hence, weight per inch of roll face also increases.

To determine with any degree of certainty the relationship between roll speed, travel and weight for any stock which would give maximum rate of beating without risk of injury to the stock by too great roll pressure would require a great amount of investigation. When done, the investigation would apply to that one stock only. In cases where beater action is undesirable, it isn't possible to change roll weights much, but attention can be given to travel and roll speed. Travel, and hence fibrage formation, often can be greatly improved by relatively easy and inexpensive tub alterations. Roll speed usually can be changed at little expense. Where beaters are tricky, any roll speed in excess of 1600 feet may be considered as warranting an investigation.

Flybar Spacing

Spacing of flybars (beater roll bars) varies considerably. The minimum spacing is probably about one bar per inch of roll diameter with fully filled rolls.

Wide spacing of bars facilitates entrance of stocks into the roll pockets and promotes rapid travel. Travel in excess of that required for maximum fibrage, however, is wasteful. Therefore, a combination of wide bar spacing and high roll speed may prove very costly.

On the other hand, close spacing of bars in a roll set in a poorly designed tub giving poor travel, is likely to result in inadequate fibrage, slow beating action and a tricky beater.

Old beaters usually were constructed with more bars per inch of roll diameter than beaters of more recent date. To some extent, this change was due to the introduction of the bandless roll, the mechanical design of the bar locking arrangement of such a roll requiring a certain minimum pitch of bars. A roll of this design often shows a ratio of about one bar per inch of diameter, or slightly higher, such as 66 bars in a 62-inch roll. Some old flat-floor Holland beaters have been observed with 68 bars in 48-inch rolls, thus giving a ratio of 1.42 bars per inch.

The travel in these last mentioned beaters was poor, even at rather low densities of furnish; and plugging of the rolls, when furnishing, caused much trouble. These conditions, however, were easily corrected. Travel was improved in part by building up the floor to give about eight inches fall from the rear of the backfall around to the forward end of the midfeather. Plugging was cured and travel further improved by cutting out six bars—thus leaving 62 active bars—still a large number in proportion to the roll diameter. The ratio of active bars (1.29) compares closely with that of beaters of another make in which 65-inch diameter rolls are filled with 82 bars, giving a ratio of 1.26.

Comparing the action of the two latter rolls on a basis of inch-cuts per minute with a roll having a ratio of 1.0 (as 54 bars in a 54-inch roll), it is apparent that for equality in inch-cuts, the roll having the wider spacing must run much faster, and faster in the ratio of 1.29 to 1 or 1.26 to 1. Since power consumption goes up with the square of the speed, equality in inch-cuts is obtained only at the cost of an increase of power to the extent of 58 to 67 per cent.

With wider spaced bars, stock enters roll pockets more freely. The extent or degree of this entrance is dependent largely upon the density of the furnish and the length of fiber. These conditions may be urged as an adequate reason for wide bar spacing. However, when a beater roll with closer bar spacing is run at a lower speed to give the same number of bars passing over the bed plate in any time interval as a roll with wider spacing, more time will be allowed for entry of the stock into the roll pockets while a bar is moving from the point of engagement with the stock to the bedplate.

Assuming that the bars are of the same thickness in both cases, more of the arc over which entry occurs will be taken by the bar edges of the roll with closer bar spacings. Also stock, especially heavy stock, does not enter narrow spaces in a manner directly proportional to the width of the space. This characteristic also is affected materially by fiber length. A small reduction in the width will reduce flow much more than in direct proportion. Conversely, a small increase in width will increase the flow much more than in proportion to the increased width.

Two references to bar spacing of cluster-filled rolls, commented upon by Smith and covering results reported by Kirchner (*Wochenblatt für Papierfabrikation,* 1939) follows:

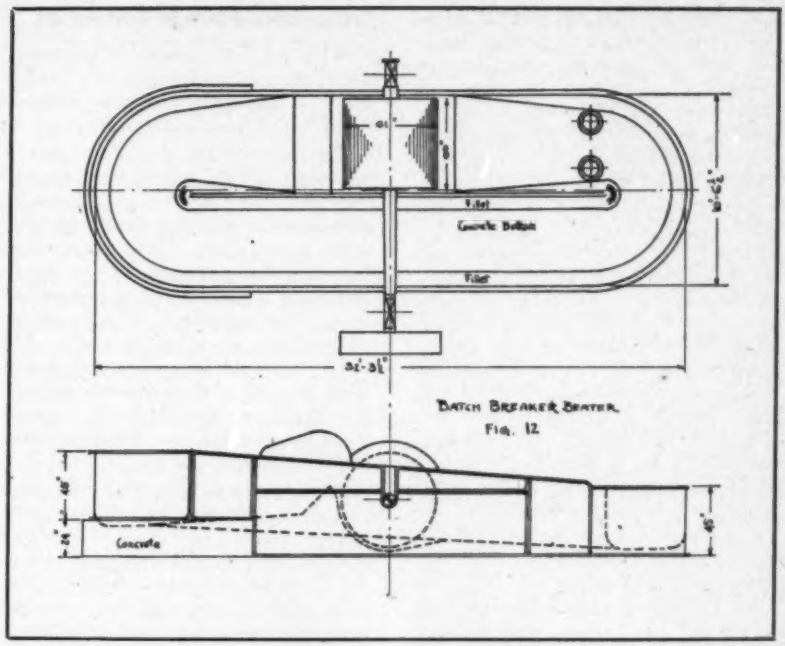
(1) A roll having spaces between bars of 2.54, .845 and .845 in. (64.5-21.5-21.5 mm.) and a bar thickness of .276 in. (7 mm.) was changed. The new bars had a thickness of .394 in. (10 mm.). They were spaced 2.94, .472 and .472 in. (74-5-12-12 mm.). The total width of pockets per cluster was reduced from 107.5 mm. to 98.5. "Nevertheless it was found after the change had been made that the travel of the stuff in the beater was greatly improved."

(2) A cluster-filled roll having spaces of 1.96, .688, and .688 inches (50-17-17 mm.) was changed to uniform spacing of 1.04 inches (25 mm.). Quoting Smith: "The transporting capacity of the roll was then found to be considerably diminished. It is thus seen again that the wide cell fills to a greater extent than the theory would lead one to anticipate."

Accordingly, in designing a beater to obtain maximum beating effect with minimum power, a condition promoted by a greater number of bars proportional to diameter, the width of pockets may not be unduly reduced.

If the width is reduced materially from widths found in practice to give satisfactory travel, the tendency to lessened entry of stock must be offset by provision to maintain entry. To this end, the diameter of the roll may be increased somewhat, also the depth of tub and also the depth of submergence of the roll in the stock. If these changes are not made, it may be necessary to operate the beater at a somewhat lower consistency than anticipated in order to insure adequate fibrage.

Table 7, which covers some design details of European beaters, has been prepared from data on various beaters appearing at various points in Smith's treatise. In connection with the derived ratios of bars per inch diameter, keep in mind that in some, if not all, cases the rolls were cluster-filled. No information in the text covers this point.



DUTCH BREAKER BEATER.
FIG. 12.

Cluster Fillings

A cursory reading of British and other European literature on beaters indicates that the use of cluster fillings is very common over there. Although such fillings are not common in this country, they are sometimes advocated. The thought behind such recommendation is: by placing more bars in a roll, the time of beating will be reduced.

It is interesting to note Dr. Smith on this style filling:

"It has already been seen that the primary essential for obtaining efficient beating is that sufficiently large fibrages shall be deposited on the edges of the flybars. A necessary condition to the deposit of such a fibrage is, however, that during its passage through the stuff the edge of the flybar must encounter at least as many fibers as it is expected to retain. It has furthermore been seen that the edge of a flybar following a wide cell encounters more stuff than one following a narrow cell. It, therefore, follows that if the circulation is such as to cause a fibrage of the correct size to be deposited on a flybar following a wide cell, then a flybar following a narrow cell will take up too small fibrage. Conversely, if the circulation is so rapid as to provide adequate fibrages for the bars following narrow cells, then a great deal of stuff will be transported unnecessarily in the wide cells. This superfluous transport requires power which represents so much loss and the beating loses in efficiency. Arranging the flybars in clumps must, therefore, be regarded as uneconomical."

Travel of Stock

Physical laws governing the flow of stock are complex and obscure. In part, they reflect the hydraulic laws governing the flow of fluids; in part, the movement, impelled by gravity, of solids. To what extent one or the other set of laws predominates depends upon the consistency of the furnish, the stiffness of the fibers and their length. It is exceedingly doubtful that all conditions can be evaluated to the extent necessary to write a mathematical formula by which to determine the rate of flow under any assumed set of conditions.

At densities so low that the fibers have little or no contact one with another, the flow may be practically the same as the flow of water. Such densities, however, are lower than any employed in beating.

At beating densities, flow is more a matter of sliding movement of a more or less solid mass. Resistance to flow is, in small degree, a matter of friction of the mass against the surfaces of the channel. It is much more a matter of internal friction of a mass of fiber lubricated with water. The less the amount of water, the greater is the internal friction.

Since internal friction is a major element in stock flow (it follows that rate of flow varies with the character of the fiber. Smooth, slippery, fine and short fibers flow with less resistance than long, coarse and stiff fibers. This characteristic is shown by the action of various stocks traveling in the beater.

In the same or similar tubs, the relative densities for equal rate of travel of kraft, bleached sulphite and mixed furnishes of deinked paper stock and unbleached sulphite in 50-50 proportion, are about seven, eight, and nine per cent, respectively. With the formation of hydrated cellulose during the beating, speed of travel increases, in part, due to the incidental shortening of fiber length; in part, due to the greater pliability of the fiber, and, in part, to the lubricating effect of the gelatinous cellulose formed as a coating on the fibers, and in solution in the water.

TABLE 7—Some Design Details of Six European Beaters

	1	2	3	4	5	6
Roll diameter (mm.)	940	1400	1400	1200	1250	800
Roll diameter (in.)	37	55	55	47.2	49.2	31.5
Roll face (mm.)	890	1050	1400	900	850	800
Roll face (in.)	35	41.3	55	35.4	33.5	31.5
Bars (number)	60	100	96	75	72	66
Bars (per in. diam.)	1.62	1.82	1.75	1.58	1.46	2.10
Capacity (lb.)	180	380	300	235	124	81
Capacity (kg.)	397	838	661	518	273	178
Consistency (per cent)	6.0	6.5	7.1	6.9	4.1	3.1
Revolutions per min.	320	130	138	158	130	200
Roll speed fpm.	3090	1870	1990	1960	1675	1640

In common with the flow of semi-solid materials, stock at beating densities exhibits marked resistance to changes in direction of flow, to changes in the cross-section of the channel, or any other conditions causing internal friction. This condition may be noted in any beater heavily furnished. In such a beater, there will be as much drop in level of the surface of the stock rounding the end of the midfeather as in ten or twelve feet of straight travel along the back channel. With this characteristic in mind, it is evident that a greater amount of fall for the same operating density must be provided for in a tub with hollow midfeather than in a tub of the same length where the midfeather divides it into two channels of approximately equal width. This provision is necessary because of the two changes in cross-section; namely, at the entrance to and exit from the narrower back channel.

In considering what causes the stock to travel, it is obvious that the roll is the propelling agent, because there is no travel with the roll standing still. However, it is a great mistake to assume that the speed of travel is proportional to roll speed. Dr. Smith goes so far as to say that the speed of travel is independent of roll speed. This statement may be considered true within certain limits as the roll speed could not be reduced indefinitely without the travel being lessened at some point. What apparently takes place is that on starting a roll to turn in a tub filled with stock, the roll pockets are filled; and this stock, except for some carried over, passes over the backfall to start circulation. At the same time, by taking away stock lying against the face of the roll, the level of stock at this point is reduced and the tendency of stock to enter the roll pockets is lessened.

The lessening of the depth of stock against the roll face along with the increase in depth back of the roll, creates a rate of flow which is dependent upon the density of stock, the character of the fiber, the slope of the bottom of the tub, and other tub characteristics affecting flow. This rate of flow or travel remains practically constant. Increase of roll speed affects the rate of travel little, if any. It merely results in a lessened filling of the roll pockets. If greater travel is wanted, either the density must be reduced, or the tub floor must be given more slope.

Thus, it becomes apparent why high roll speeds accomplish nothing with flat floor tubs. Rather it causes great waste of power and also poor beating because of the lessened formation of fibrage on the bar edges.

Travel and Fibrage Formation

With the roll turning at operating speed, the roll pockets are never fully filled. This fact can be easily demonstrated with any operating beater.

The rate of travel can be determined with fair accuracy by timing the travel of a spot along the back channel. By plunging a stick upright in the stock, it can be shown that the velocity is substantially constant from surface to bottom. The stick remains in its vertical position; if the velocity were higher or lower down in the stock, it would lean more and more. With the rate of flow determined, and the width and depth of the channel measured, the volume of flow is simple arithmetic.

Having a measurement of the diameter of the roll, its face, the thickness of the flybars, and depth from bar edge to wood, the total volume of the roll pockets is obtained. This volume multiplied by the speed of the roll gives the volume of the roll pockets passing the bedplate in any selected time. The volume of stock flow divided by the volume of roll pockets, calculated for the same time interval, gives the fraction of the roll pockets filled with stock.

For example, assume a beater having a roll 54 inches in diameter and a 48-inch face, filled with 60 bars each ½ inch thick. Assume a depth from cutting edge of bars to wood of 3 inches. Consider the back channel as being 54 inches wide, depth of stock in the channel 30 inches, and travel as 15 fpm.

From the channel measurements, the cross-section (disregarding fillets) is 1,620 square inches. Since 15 feet is 180 inches, 1,620 multiplied by 180 gives 291,600 cubic inches of flow per minute.

The total cross-section area of the roll (54 inches diam.) is 2,290 square inches. The area of the circle of the woods (48 inches diam.) is 1,809.6 square inches. The cross-section area of bars is 60 x ½ x 3, or 90 square inches. Adding this amount to 1,809.6 and deducting from 2,290, leaves 390.4 square inches as the cross-section area of all pockets. Multiplying this figure by the face of the roll gives 18,739 cubic inches as the volume of roll pockets. If now, the roll is turning 120 rpm, the volume of roll pockets passing the bedplate per minute is 2,248,604 cubic inches. Dividing the volume of circulation (291,600) by the roll pocket volume per minute equals 0.1296, or practically 0.13. Therefore, the pockets are filled to about 13 per cent of their volume by stock.

Filling of Pockets Necessary for Maximum Beating Effect

From extensive experiment on the formation of fibrage on a bar working with stock at various densities, and from observation of operation of various beaters, Dr. Smith arrives at a figure, expressed in millimeters, covering average depth of stock in pockets necessary for maximum fibrage formation, the depth necessary varying with density. Translated into percentage of pocket volume, the figures range from 18 to 24 per cent for densities from 6 per cent to 7 per cent. The necessary filling decreases rapidly with lower densities, and increases very rapidly with higher.

In the preceding example, with pockets filled to about 13 per cent of their volume by stock, the beater would reach maximum beating effect at about five per cent density. Increase in density by heavier loading would reduce the beating effect by lessening the rate of travel. In consequence, the fibrage formation would be reduced. On the other hand, if at the rate of travel assumed, the actual density were seven per cent, the beater would fall short of realizing its possibilities by the ratio of (24 minus 13) divided by 24, or 46 per cent, in other words 54 per cent efficient. To secure maximum beating effect would require a change in tub design to increase the rate of travel (still considering 7 per cent stock density) from 15 to 28 fpm.

An exception should be noted in regard to the methods given for calculation of beating effect. This exception is in case of an appreciable "carry-over" of stock—stock not delivered over the backfall but carried over the roll and returned to the tub in front of the roll. Such stock is acted upon again by the roll just as though it had passed over the backfall and traveled around the tub to the face of the roll. If the quantity of carry-over is at all great, the amount should be measured and added to the volume of circulation determined by measurement of flow in the back channel. This circumstance explains why many old flat floor Holland beaters will beat off in a satisfactory time even when travel around the tubs is very slow.

Variation in Fibrage with Consistency

The tabulation on variation in fibrage with consistency (Table 8) has been read from curves given by Dr. Smith, whose experimental work was done by passing a narrow, square bar by hand through a vat of stock. The principal value of the data is in indicating rate of change of weight of fibrage formation with consistency. It

indicates what increased rate of travel of the beater, with necessary pitch of floor, is required for various consistencies to develop maximum beating effect at any assumed roll speed. At the same time, it indicates the great waste of power which will result from any rate of travel much in excess of that necessary.

Dr. Smith gives two sets of curves: one, with grams fibrage plotted against consistency at various fiber lengths; the other, grams with fiber length at various consistencies. His treatise should be consulted if more details are desired.

Support of Bedplates

A factor of great importance on beating effect is the rigidity of the support of the bedplate. The action between roll bars and plate bars is greatly affected by the clearance between the moving and stationary bars. It is a milling action which, obviously, cannot be fully controlled or be fully effective unless the bedplate support affords suitable rigidity. The more nearly the bedplate can be supported to a rock-like solidity, the better will be the beating. Good and efficient beating cannot be done on a vibrating bedplate.

It was formerly the practice, when building mills to make fine papers, to provide drainers in the basement of the beater room to receive the half-stuff. These drainers were commonly built with heavy brick walls which also served as supports for the beater lighter posts. In addition, the bedplates were set on arches of heavy brick masonry which were sprung between the drainer walls. Thus, rigidity was provided.

Later, mill designers, apparently lacking insight into beating essentials,

Table 8—Grams per Meter Fibrage

Fiber Length mm.	— Consistency (per cent) — 3	4	5	6	7	8
1.02	.3	.6	1.0	1.7	2.5	3.6
1.12	.5	.8	1.4	2.2	3.1	4.2
1.24	.75	1.2	1.7	2.6	3.7	4.9
1.47	.9	1.6	2.3	3.3	4.4	5.7
1.75	1.2	1.9	2.7	3.9	5.3	6.7

gave attention to elimination of numerous basement columns. They used long beams and girders and floor slabs of very considerable length and width. The only consideration given to beaters was that of static load.

Such floor designs lacked rigidity, regardless of the adequacy of their strength. Also, during the intervening years, beaters were built bigger and bigger—larger tubs, longer bedplates, and heavier rolls running at higher speeds.

An example of such construction, is a mill, built in 1916, having a reinforced concrete floor, of flat slab two-way reinforcing, on columns placed on 16-ft. centers, both ways, the slabs being square, with no slab stiffening. The beaters were set on this floor without reference to floor construction.

The mill was built to make book papers and coating raw stock from furnishes of cooked paper stock and sulphite. Therefore, the beaters were used mainly as mixers with little action of roll on bedplate. So no great harm resulted from the floor construction.

In contrast to this situation, however, was another mill where the product required drastic beating. The necessity of providing as nearly rock-like support of the bedplates as could be secured was realized in the building of this mill. Massive concrete piers were built to receive the bedplates. These piers not only extended down to the basement, but actually fifteen feet below basement floor level to rest on hardpan.

Beaters for this mill were selected to give beating results based on performance data of beater in another mill making the same product. The beaters from which performance data were taken were set on concrete floor slabs carried on structural steel framing and there were no special supports under the bedplates.

The new installation, operating eight beaters, was figured to produce 4,000 pounds of paper per hour. Over a short term of years, with the addition of only two beaters, the actual production reached 9,000 pounds per hour. Jordans were added only in proportion to the increased production. Accordingly, 900 pounds of stock were prepared per hour per beater as against 500 pounds for each of the beaters in the mill without solid plate support.

If piers under the bedplates are objectionable, if they interfere with chests, piping or other equipment, the floor framing can be laid out so that heavy beams or girders are located under the lighters and also under the center lines of the plates. Or, as was done in another instance, after deciding on the beater layout, a line of columns and girders can be located under the plates. While the rigidity so secured is not equal to direct support on piers, it is vastly better than that obtained by supporting plates on relatively flexible floor slabs.

EDITOR'S NOTE: Part I of this series appeared in the December, 1946, issue; Part II was published in the January, 1947, issue of this magazine. Part IV, the concluding installment, will be published in March.

The South's Great Tree Farm*

▶▶▶ GREATEST potential tree farm on earth is the 210 million acres of forestland in the eleven states of the South, and the paper industry would no more engage in a cutting program which would eventually destroy its wood supply than a coal mining compay would dynamite its mine shafts.

We can't live without wood, and the rapidly expanding uses of our products makes it imperative that the present supply not only be maintained, but that the forests be made to grow more and more wood to meet the increasing demand of the years and decades ahead.

The first step in the dual job of preserving the forests, and yet capitalizing on them, is to educate the public on the facts of the situation.

We have the positive statement of the U. S. Forest Service that with growing stock built up, intelligent cutting, and protection from fire, production of wood in the South can be doubled. It requires no mathematical wizardry to imagine what this could mean in revenue — and continuing revenue—for these states.

I believe very passionately in our American enterprise system and its indefatigable defender, the American newspaper. . . . I believe that it is the solemn obligation of business men to rally to the defense of your institution because if you go down, all is lost which we hold so dear in our way of life.

Unfortunately the public has much misinformation about the growth of trees and their use. On the average, only 9 per cent of the wood cut in the nation is for pulpwood; fuelwood is 16 per cent; lumber 49 per cent. And each year forest fires, insects, and disease destroy more than the total amount of pulpwood consumed annually by the pulp and paper industry.

(*) Excerpted from address given before the Georgia Press Association by Donald J. Hardenbrook, vice president of Union Bag & Paper Corporation, Savannah, Georgia.

Glycerine's Expanding Role *in paper production*

GEORGIA LEFFINGWELL, Ph.D.
and
MILTON A. LESSER, B.S.

▶▶▶ PROGRESS IN the utilization of glycerine in paper processing has been so rapid that an article the authors contributed to this magazine less than two years ago (*1*) is already behind the times.

As one of the industry's valued plasticizing agents, glycerine finds extensive use where it is desired to impart flexibility and softness. The fact was well emphasized in the review by Collins (*2*) on wet strength paper. He pointed out that because there is a tendency for some wet strengthening agents or treatments to make the paper stiff, harsh, or brittle, means for plasticizing or softening the sheet is of primary importance. It is significant that in a high proportion of the processes cited by this authority, glycerine was employed as a major plasticizer. Thus glycerine is used for softening viscose-treated papers and those prepared with certain other cellulose derivatives, for plasticizing glue-treated sheets, and, in some instances, for the plasticizing of urea-formaldehyde resin-treated sheets.

Newer developments have continued to utilize this property of glycerine. Indicative is Broderick's (*3*) patent describing the production of absorbent paper sheets suitable for use as toweling. To produce sheets having high dry and wet strength as well as resistance to linting, the paper is treated with a solution containing hydroxyethyl cellulose, glycerine, and glyoxal.

Of related interest is another process (*4*) for making paper products which may be used as substitutes for textiles such as sheets, pillow cases, tablecloths, napkins, window curtains, and the like. To impart the requisite characteristics, such as high wet and dry strength, softness of texture and flexibility, waterleaf paper or other unsized and absorbent paper is first impregnated with a dilute aqueous solution of glue or similar binder, and dried. The web is then impregnated with a tannable protein substance containing a "super abundance" of a plasticizing agent, like glycerine. Best used at a *p*H of 9.2 to 9.3, a basic formula for this purpose consists of:

	Parts
Chrome stock glue	1.0
Glycerine	2.5-5.0
Zinc oxide	0.8-1.0
Water, to make	10.0

After passing through this bath, the paper is passed through rolls to remove excess fluid, and is then subjected to tanning treatment with formaldehyde or formaldehyde-liberating agents.

More recent is a glycerine-utilizing method for increasing the pliability of paper. As described in a Canadian patent, (*5*) the fibers of a paper are impregnated with an aqueous solution consisting solely of urea and glycerine in the amount of about 1 to 20 pounds of urea per 1,000 pounds of paper and glycerine in the amount of about 10 per cent of the urea.

The importance of glycerine in the production of glassine paper, greaseproof paper, and vegetable parchment is indicated in Government statistics (*6,7*) covering glycerine consumption by industry. In such listings, papers of this sort are given a category separate from other types. In 1941, the last prewar year, 2,008,000 pounds of glycerine went into the production of glassine, greaseproof, and vegetable parchment papers, while another 1,540,000 pounds were used to make other kinds of paper.

The trend to such utility continues. Thus, glycerine is used by Cate (*8*) in a process for increasing the oil-resistance and improving the transparency of glassine papers. The process is described in a recent patent. In other patents methods are given for improving the moisture vapor resistance of glassine papers used for wrapping foods. In one of these methods, (*9*) a sheet of glassine is first treated with an aqueous solution of glycerine and anhydrous dextrose. The sheet is then coated with a melt comprising a major amount of paraffin wax and minor amounts of synthetic rubber and rubber derivative. In another procedure (*10*) to prevent swelling, cockling, buckling, sogginess, and loss of transparency resulting from entrapped moisture, cellulose wrapping sheets such as glassine, cellophane or the like are coated on the outside with a glycerine-plasticized latex emulsion. The sheets are then waxed on both sides.

Because, in addition to its plasticizing action, glycerine is also immiscible with most oils and organic solvents, it finds wide usage in preparing greaseproof papers. Continuance and expansion of such usage is evident in newer procedures. Thus, in Rich's (*11*) process of imparting greaseproof characteristics to paper, the paper is first coated with an aqueous solution containing 5 to 20 per cent by weight of a reduced viscosity starch, 1 to 10 per cent of glycerine and 0.5 to 2 per cent of a water-soluble methyl ester of cellulose. The paper is dried and then coated on the same side with an aqueous solution containing 1 to 10 per cent of cellulose methyl ester and 1 to 5 per cent of glycerine, and again dried.

Hatch and Rollins (*12*) have developed a method which is especially suitable for making containers resistant to grease, oil, and water. In their process, a base material like paper, boxboard, fiberboard, and chipboard or the like is coated with a flex-responsive, glue-glycerine composition containing a fixing agent. The type formula for such compositions is as follows:

	Per cent
Glue	16-30
Water	40-67
Sodium nitrate	2/3-6½
Gelatin	1½-5
Glycerine	12½-20
Acetic acid	3-15
Hexamethylenetetramine	½-3

Grease-resistant glue coatings for containers have been described in Bennett's (*13*) latest reference text. One of these consists of:

	Per cent
Glue	11.1
Glycerine	13.3
Cane sugar	3.1
Anti-foaming agent	0.9
Water	71.6

Such a flexible composition may be coated by a spreader on materials like paperboard for subsequent production of boxes for greasy but non-fluid materials. Alternatively, finished paper containers may be coated with a sprayed-in lining of this mixture.

Other glycerine-utilizing coatings have received attention during the last few years. For instancee, glycerine has been recommended as a suitable plasticizer for sodium silicate films applied to various paper surfaces. Considered (*14*) particularly effective in preventing brittleness of the heavier, varnish-like silicate coatings, this use calls upon glycerine's humectant action, which is intimately associated with its plasticizing effects. In another case, it is claimed (*15*) that the conjunct use of glycerine and a drying oil in a composition containing soybean protein, pigment, and other substances,

provides water-resistant compounds useful in paper coating.

Considerable interest has been aroused by a new method (*16*) in which the high vaporizing temperatures of glycerine solutions permit molten metals to be sprayed upon paper and other inflammable surfaces without causing charring or burning. The secret of the process lies in the use of glycerine "protective fluids" which form protective vapors during the spraying. Since glycerine volatilizes at these temperatures without leaving a residue, it does not interfere with or otherwise affect the continuous and air-impervious layer of metal formed on the paper.

These protective liquids may consist of equal parts of glycerine and water, but the proportions may be varied, even to practically excluding water. In this method, the paper is wet with the glycerine solution, and, with the paper suitably supported, molten metal is sprayed on its surface. Spraying must be done rapidly, and the time element, a matter of seconds, must be varied according to the temperature of the sprayed metal and other factors. Metals applicable by this process include aluminum, copper, gold, silver, zinc, tin, brass, and even certain stainless steels.

With this process, the metal coating adheres so firmly that the treated paper can be subjected to mechanical stresses without danger of separating. Papers coated with a thin film of aluminum or tin have proved to be impervious to air and liquids and are claimed to be admirably suited for use in packaging foods. If desired, the metal coatings can be buffed, polished, or given other finishing treatments or decorative effects.

Glycerine has also found new uses in the formation of other special compositions. For instance, two patents (*17, 18*) suggest its use in preparing coating compounds for the inner surfaces of containers for holding bituminous materials such as asphalt, pitch, or tar. The plasticizing action of glycerine is also utilized in the production of adhesives suitable for making laminated paper containers (*19*). Thus an adhesive which remains pliable and flexible indefinitely, regardless of the presence of moisture, is formed from about 100 parts of casein, 20 to 30 parts of triethanolamine or urea, 50 to 70 parts of glycerine, and sufficient water to provide the requisite working properties.

Glycerine has long been used in bonding agents employed in making paper products. To the long list of such products may be added a new adhesive for cementing the edges of tablets or pads, or for the preparation of manifolding forms. According to the patent specifications, (*20*) such a tablet cement comprises:

Polyvinyl acetate (55% aqueous emulsion)	1 gal.
Dibutyl phthalate	8 oz.
Glycerine	2 oz.

It is said that even this small amount of glycerine greatly increases the tenacity of the film formed from the cement.

Various more highly specialized paper products may call upon glycerine's several properties. For example, its hygroscopic or humectant action may be used to control the humidity of moisture-containing articles, as that they may be stored or dispensed in nonhermetically sealed packages. Details on the manufacture of the special paper layers particularly suitable for packaging cigarets, are given in Johnson's patent (*21*). Other glycerine properties are utilized in the production of a number of novel typewriter and other reproduction papers (*22, 23, 24*). There is a patented method (*25*) for making rosin sizing for paper in which glycerine may be used to impart stability against freezing.

Before concluding, we should mention a special glycerine-containing ink for use in the examination of paper. Developed by Noll (*26*) as an improvement over his original ink for testing the sizing properties of paper by the application of the ink-penstroke technic, the new permanent ink is especially effective both for the penstroke and flotation tests. It consists of:

Trypan blue	10 Gm.
Glycerine	10 Gm.
Gallic acid	5 Gm.
Resorcinol	1 Gm.
Hydrochloric acid (normal solution)	100 ml.
Water	1 liter

This is termed a "semi-gallate" ink because it forms iron gallate with the traces of iron normally present in paper. The same general effects were obtained when Gallocyanin dyes were substituted for the Trypan blue and gallic acid.

Bibliography

1) Leffingwell, G. & Lesser, M. A., PAPER, IND. & PAPER WORLD 25, 44, Apr. 1945.
2) Collins, T. T., Jr., PAPER IND. & PAPER WORLD 25, 263, June 1943.
3) Broderick, A. E., U. S. Pat. 2,285,490, 1942.
4) Behnke, J. M., U. S. Pat. 2,279,549, 1942.
5) Beecher, C. E., Canadian Pat. 418,367, 1944.
6) McConlogue, W. A. & Lenth, C. W., *Fats & Oils Situation*, Feb. 1944, p. 11.
7) Rager, C. A., "Glycerine, Synopsis of Information," Washington, U. S. Dept. Commerce, No. 47, Dec. 1945.
8) Cate, P. H., U. S. Pat 2,387,429, 1945.
9) Bryce, W. H., U. S. Pat. 2,367,563, 1945.
10) Rhodes, C. M. & Sermattei, J. P., U. S. Pat. 2,354,060, 1944.
11) Rich, E. D., U. S. Pat. 2,317,696, 1943.
12) Hatch, W. E. & Rollins, J. H., U. S. Pat. 2,367,678, 1945.
13) Bennett, H.: *Chemical Formulary*, Vol. VII, New York, Chem. Publ. Co., 1945, p. 327.
14) Anon.: *Silicate P's & Q's*, 23, No. 6, 1943.
15) Heberer, A. J. & Phillips, C H., U. S. Pat. 2,274,695, 1942.
16) Hamel, W. W., U. S. Pat. 2,400,304, 1946.
17) Smith, H., U. S. Pat. 2,352,865, 1944.
18) Manor, W. O., U. S. Pat. 2,293,348, 1942.
19) Bronson, F. L., U. S. Pat. 2,300,907, 1942.
20) Zimmerman, H., U. S. Pat. 2,387,967, 1945.
21) Johnsons, C. E., U. S. Pat. 2,329,908, 1943.
22) National Cash Register Co., Brit. Pat. 546,749 and 546,750, 1942.
23) Green, B. K., U. S. Pat. 2,299,693, 1942.
24) Marriot, R. H., U. S. Pat. 2,317,789, 1943.
25) Marshburn, R. T., U. S. Pat. 2393, 1946.
26) Noll, A., *Papier Fabr.-Wochbl. Papier-Fabr* 1943, p. 298 (through) *Chem. Abstr.* 38:4801, 1944.

◆

Kimberly-Clark Laboratory

(Continued from page 1591)

new developments, and the pace of technological change will be an ever-accelerating one. The public, in the end, reaps the benefits, but in the process the technical director of succeeding generations will have technical competition that will make our present technological competition fade into insignificance.

Let us have one thought—be it envy or pity—for the manufacturer of the future who must not only finance this enlarged research program but the new machinery, buildings and organization to put its results into production. Kimberly-Clark has followed such a course because its management believes that corporation success is achieved only by creating maximum value and benefit for everyone connected with the organization. As we are, and remain, a source of supply which helps to keep our customers competitive—in every way—so we gain in security and stability for the work force, stockholder and community. That is why Kimberly-Clark has today the most extensive commercial technical laboratory in the industry.

Paper SKETCHES . . . . . .

THIN PAPER, REMARKABLE FOR ITS OPACITY AND TOUGHNESS, WAS USED IN THE XYLOGRAPHIC PRINTING OF THE WORKS OF CONFUCIUS, ISSUED IN CHINA ABOUT 900 A.D.

ONE SHILLING A YEAR WAS THE RENT THAT THOMAS WILLCOX AND THOMAS BROWN AGREED TO PAY FOR THE LAND ON WHICH THEY BUILT A PAPERMILL IN 1729. THIS LAND WAS LOCATED ON THE WEST BANK OF CHESTER CREEK, TOWNSHIP OF CONCORD, PENNSYLVANIA.

THE PHILADELPHIA RECORD WAS ONE OF A NUMBER OF UNITED STATES NEWSPAPERS WHICH FOUND THEMSELVES WITH INSUFFICIENT NEWSPRINT IN 1946. THIS NEWSPAPER, STARTING WITH THE SEPTEMBER 29th ISSUE AND ENDING WITH THE ISSUE OF OCTOBER 22nd, USED ABOUT 1800 TONS OF 34 LB. KRAFT TO PIECE OUT ITS SHORT SUPPLY.

LEORIER DELISLE, LATE 18th CENTURY FRENCH PAPER-MAKER, MADE PAPER FROM LIME TREE BARK WHICH WAS USED IN THE PRINTING OF A SMALL 156 PAGE EDITION OF THE WRITINGS OF CHARLES MICHEL DE VILLETTE.

A HINT ON SIZING -

KELGIN FILLS THE BILL FOR THE MAN WHO PAYS THE BILL!

Kelgin is the economical answer to your surface sizing problems. Easy-to-use, it insures a perfect base for high gloss and ink brilliance.

Kelgin provides a uniform, smooth, dense surface—controls penetration of printing ink oils and waxes. It is completely adaptable to water box application in the calender stacks. Kelgin will not produce foaming, picking or sticking to the rolls. It is equally soluble in hot or cold water.

Kelgin is a rigidly-processed product of nature. Free of impurities, it insures uniform, exact results. Our technical department will gladly discuss your surface sizing problems with you. Drop us a line today.

KELCO COMPANY

20 N. Wacker Drive, CHICAGO-6 — 31 Nassau Street, NEW YORK-5 — 530 W. Sixth Street, LOS ANGELES-14

Cable Address: KELCOALGIN — New York

Canadian Associations Hold Annual Meetings

▶▶▶ RECORD ATTENDANCE, the presentation of a well-diversified program of technical papers, and a down-to-earth discussion of various operating and technical problems through intimate and definitely specialized group discussions epitomizes the thirty-third annual meeting of the Technical Section of the Canadian Pulp and Paper Association.

Held on January 29, 30 and 31, 1947, in the Mount Royal Hotel, Montreal, Quebec, the convention devoted seven sessions to the presentation of papers and three sittings to fifteen group discussions. Interest in each session ran high, so it would be difficult to point to any one sitting as constituting the highlight meeting of the convention.

The Technical Section Business Luncheon, held on the second day of the convention, furnished an ideal time for some of the executives of the group to report on the affairs of the organization. At the same time, it allowed time for election of officers and for the presentation of three awards to its membership.

Douglas Jones Presents Report

Douglas Jones, secretary-engineer, in presenting his annual report at this meeting, related, in part; that the Technical Section admitted one hundred and forty-six new members during 1946; that the active membership total as of December 31, 1946, was 800; that some sixty applications have been received since January 1, 1947; that two members were lost during the year through sad passing of George McKee and Sidney B. Fraser; that the 1946 summer meeting was held in Port Arthur-Fort William; that at this meeting the Mid-West Branch, organized in 1945, acted as host; that the program was devoted exclusively to group discussions planned by the various committees. (Other features of this meeting were the mill visits, symposium and the dance arranged by the Mid-West Branch); that at the official dinner John Stadler was elected to life honorary membership in the Section; that during 1946 two new branches of the Technical Section were formed, viz., the Pacific Coast and the Chaleur branches; that the Ottawa Valley, Niagara, Mid-West and Quebec District branches report a successful year of meetings, and they continue to grow and serve the important groups of mills involved.

Mr. Jones also highlighted the efforts of each committee of the Technical Section during 1946.

In part, he said:

The Alkaline Pulping Committee has held ten meetings this year, two of these combining mill visits with the meetings, a meeting in the spring being held at East Angus and one in the fall at Bathurst.

The Board Committee was chiefly interested this year in continuing work requested by the Board Section of the Association. The work has consisted of the investigation and development of testing procedures for the folding, sizing, printing characteristics and grease resistance of paperboard.

Another activity of this committee has been a study of drainage versus freeness for paperboard stocks.

The Engineering Committee was reorganized last year, and for the first time a committee nucleus was located on the West coast. It chose as its major item of program the design of the groundwood mill.

The Fine Papers Committee has held seven meetings, including a two-day meeting at St. Jerome last fall. During the year a study of save-all operation was made based on a questionnaire. Replies were summarized, and the resulting report was circulated to contributing mills. An investigation of miscellaneous chemicals such as foam killers, slime inhibitors, felt-cleaners, etc., was made, and formed the basis of discussion at the meeting.

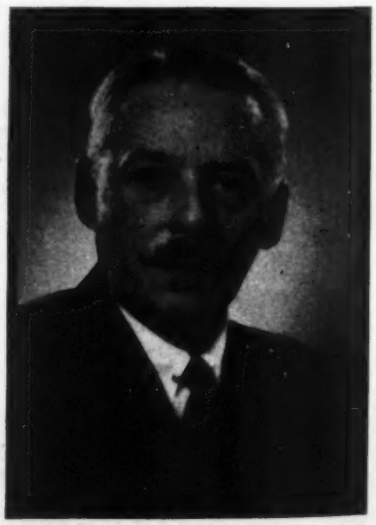
The committee has made plans for mill scale evaluation of dirt removal equipment and refiners in 1947.

The Heat and Power Committee has confined its activities to three main investigations, viz., compilation of data relative to insulation of moving radiating surfaces such as dryer rolls, compilation of data on Sheahan rope life and maintenance, and similar information on dryer felt life.

The Mechanical Pulping Committee, formerly known as our Groundwood

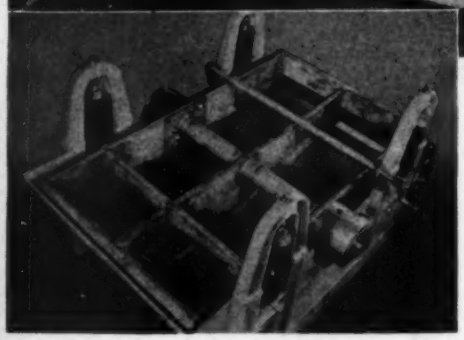
S. L. de Carteret, who was elected chairman of the executive board of the Canadian Pulp and Paper Association

A. E. Cadman, retiring general manager of the Canadian Pulp and Paper Association



F. L. Mitchell, who succeeds A. E. Cadman as general manager of the Canadian Pulp and Paper Association

Here's What Happens When You Use BIRD'S JONSSON SCREEN



Here is the complete unit — screen, vat, dam for regulating stock level, outlet for screened stock and tailings trough. It may be installed with concrete or tile-lined vat if preferred.

As you can see, the Jonsson Screen takes out the knots clean and whole but doesn't take good fibres with them. Tailings losses become insignificant.

The Jonsson Screen handles all kinds of pulp and handles it fast — up to 100 tons per day. It handles consistencies up to 1%. It uses very little power, is easy to install, operate and maintain.

Let us tell you more about the Jonsson Screen and what it can do for you as a knotter, bull screen, pulp screen ahead of brown stock washers, and screen for waste paper stock and for straw.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

Left to right (across page)—G. W. E. Nicholson, president of TAPPI; R. J. Askin, newly elected chairman of the Council of the Technical Section of the Canadian Pulp and Paper Association; R. M. Fowler, president, Canadian Pulp and Paper Association; W. H. Birchard retiring chairman of Council of Technical Section, Canadian Pulp and Paper Association; Aubrey Crabtree, general manager, Fraser Companies, Ltd.; R. L. Weldon, president, Bathurst Power & Paper Company, Ltd.

Committee, has included on its program this year the following studies:

1. Burr penetration
2. Grinding of jack pine
3. Measurement of stone surface temperatures during grinding
4. Longitudinal grinding
5. Refining of pretreated coarse wood particles

The Newsprint Committee has programmed two investigations this year through two sub-committees—one is making a study of the double suction couch, and the other has drawn up a comprehensive questionnaire on Slime Control.

The Physical and Chemical Standards Committee has completed the reclassification of existing standards which was commenced over a year ago. In addition to this, many new and revised standards have been issued with a new index during the year.

The committee has sponsored a project recently approved by the Joint Administrative Committee for a continuing series of instrumentation studies to be carried out at the Institute.

The Printability Committee, set up as a special committee some years ago, has contributed many fine reports on this complex subject.

The Sulphite Committee has worked very hard this year with two major problems, viz., the drying and bleaching of sulphite pulp. They completed the study of Factors affecting Cleanliness late in 1945, and this publication has been well received in all the pulp producing countries of the world. Based on the work they have done this year we hope to produce two publications in 1947, one on the Drying of Sulphite Pulp, the other on Sulphite Pulp Bleaching.

A critical study was made on fundamental data of the sulphite process, and, as a result, recommendations were made to the Institute through the Technical Section Council that fundamental penetration studies be carried out. In addition it has been suggested that the Institute install suitable pilot plant equipment to make thorough studies of the variables in the sulphite pulping process.

The Waste Committee has spent the year assembling data from the work of the past three years on the utilization of wood waste. A report, to be entitled "Reduction and Utilization of Wood Waste," has been completed, and will be published this year.

The Wood Chemistry Committee has continued throughout the year to meet regularly to discuss matters pertaining to the fundamental chemistry of wood and the various pulping processes. Close co-operation has been maintained between the committee and the Institute, particularly the Division of Industrial and Cellulose Chemistry.

Many of the items on the program of the Institute have been suggested by this committee, and informal discussions are held from time to time.

R. J. Askin, new chairman of the Council of the Technical Section of the Canadian Pulp and Paper Association

With the impetus given to automatic control instrumentation in war industries, our industry is belatedly recognizing the value of more complete instrumentation. As an aid to the movement, and to provide a means of interchange of information, your Council has decided to create a new standing committee. This committee will be known as the *Process Instrumentation Committee*. It will conduct studies of instrumentation in all departments of pulp and paper mills, and will make recommendations for more complete instrumentation as seems desirable and economically feasible.

A closer liaison has been maintained during the past year between the Technical Section and the Institute. We are consulted regularly on matters of Institute program, and although the Section has no official status at the Institute, I have been invited to attend regular monthly staff meetings which were inauguraed in December of last year.

During the past year, we have had the pleasure of meeting a number of visitors from mills in the United Kingdom and the Scandinavian countries. We have assisted wherever possible in arranging mill visits for, and welcoming the visitors.

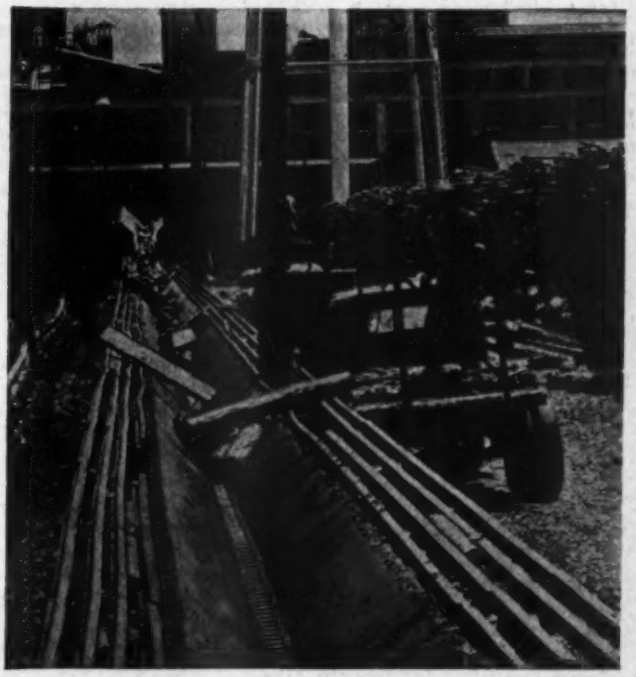
I wish to thank R. M. Fowler, A. E. Cadman, and J. Leslie Kelly, officers of the Canadian Pulp and Paper Association, whose wise counsel is always available to us.

We are very pleased to announce that B. W. Burgess has accepted the position left vacant by John Evans, whose resignation we regretfully accepted. I wish to pay tribute to Walter Birchard and the other able members of the 1946 Technical Section Council, who have given so unstintingly of their time in directing the affairs of the Section.

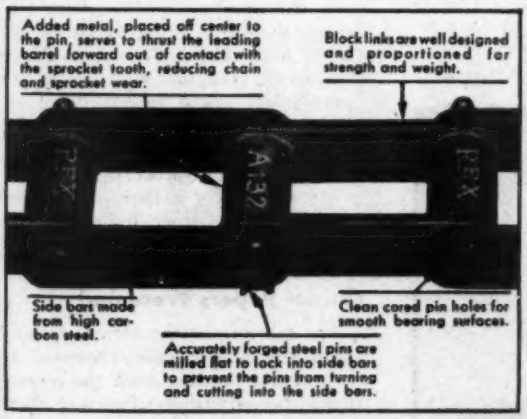
to Short-cut a Log Haul

see the Rex man!

① TO SHORT-CUT YOUR PLANNING for a new log haul conveyor or in modernizing existing installations, consult the Rex Man. He's an expert on pulp mill conveyors . . . can save you time and money in selecting exactly the right equipment for the job.



② THIS MILL, FOR EXAMPLE, took advantage of the application skill of the Rex Man. He helped design this conveyor and specified Rex Z-Metal Durobar chain belt for the job. Operating outdoors, in all types of weather and subjected to the pounding of the logs as they drop on the conveyor, the chain has given excellent service. Maintenance costs have been extremely low.

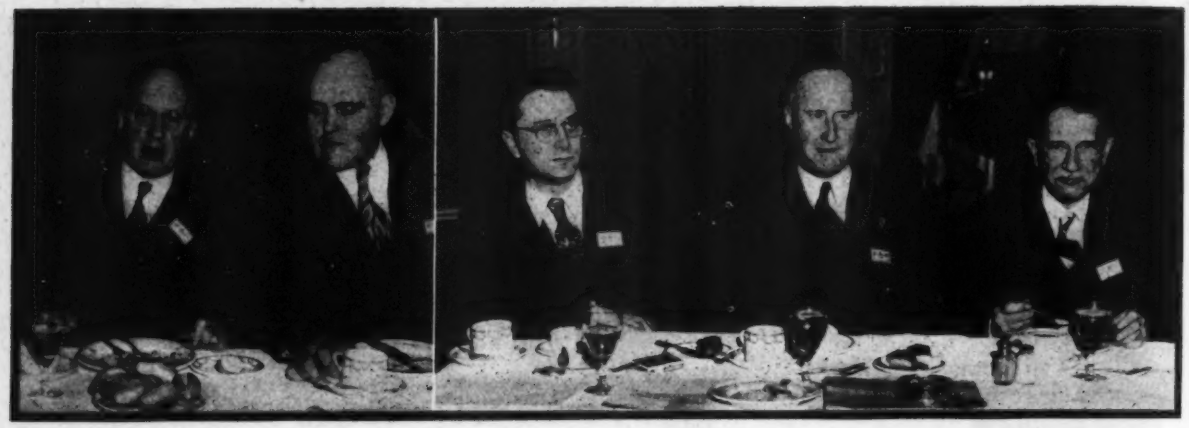

Added metal, placed off center to the pin, serves to thrust the leading barrel forward out of contact with the sprocket tooth, reducing chain and sprocket wear.
Block links are well designed and proportioned for strength and weight.
REX
A132
REX
Side bars made from high carbon steel.
Clean cored pin holes for smooth bearing surfaces.
Accurately forged steel pins are milled flat to lock into side bars to prevent the pins from turning and cutting into the side bars.

③ THE REX MAN specified Rex Z-Metal Durobar chain for this job because of the severe service conditions. As this close-up shows, Rex Durobar chain has a number of outstanding advantages, and combined with the extra strength and corrosion-resistant abilities of Rex Z-Metal, it was the right chain for the job. Take advantage of the application skill of the Rex Man to get the most from your mill conveyors.

You'll find it pays! Call him or write to Chain Belt Company, 1714 W. Bruce St., Milwaukee 4, Wisconsin.

REX CHAIN BELTS

CHAIN BELT COMPANY of Milwaukee



Left to right (across page)—A. E. Cadman, recently resigned general manager of Canadian Pulp and Paper Association; E. J. Calnan, Ontario Paper Company, Ltd.; Douglas Jones secretary-engineer, Technical Section, Canadian Pulp and Paper Association; R. G. Macdonald, secretary-treasurer, Technical Association of the Pulp and Paper Industry; Dr. Otto Maass, Pulp and Paper Research Institute of Canada

Looking forward to the years ahead, we see an increased tempo in committee and branch activity, together with an expanding program at the Institute. For this reason, we should all be on the lookout for the problems which, if solved, will have the most beneficial economic results for the industry.

Chairman Birchard Tells Progress of Section

W. H. Birchard, retiring chairman of the Section, reported continued progress of the Section throughout 1946. He announced the appointment of Bernard W. Burgess as technical assistant to Mr. Jones, thus filling the vacancy caused by the resignation of J. C. Evans to return to the industry.

He related that the Standards Committee has reclassified, re-indexed and re-issued the existing standards, and has added a considerable number of new standards; and that the Alkaline Pulping Committee has published answers to a questionnaire on cooking practice in the kraft industry.

Reference was made to the 1946 summer meeting at Port Arthur, Ontario, and to the presentation of an Honorary Life Membership in the Technical Section at that meeting to John Stadler.

Mr. Birchard also stated that a plan has been formulated to organize branches of the Technical Section from coast to coast. In addition to the four branches previously established at Ottawa, Niagara, Quebec, and Mid-West, he said, branches were formed on the Pacific coast and Chaleur Bay during the year.

Other localities, such as St. Francis Valley and St. Maurice Valley, continued Mr. Birchard, are under consideration and as soon as the mills in these districts are ready they will be organized.

The awards presented at the luncheon and their respective recipients were as follows:

Presentation of Awards Made at Luncheon

The Technical Section Service Award for 1946, a bronze medal awarded to the Technical Section Committee Chairman who has made the most outstanding contribution to the work of the Section, was presented to F. B. Bjornlund of Howard Smith Paper Mills Ltd., Cornwall, Ontario. Mr. Bjornlund was chairman of the 1946 Alkaline Pulping Committee. The award was donated by R. L. Weldon of Bathhurst Power and Paper Co., Montreal.

The Howard Smith Medal, donated by Harold Crabtree of Howard Smith Paper Mills Ltd., Montreal, and awarded to the junior member of the Section who submitted the best paper presented at the 1946 annual meeting, was won by Arne Hellstrom of Paper Machinery Ltd., Montreal. His paper was entitled "The Use of Absorption Towers for the Recovery of Pressure Gases."

W. H. Birchard, retiring chairman of the Technical Section of the Canadian Pulp and Paper Industry

The Weldon Medal, donated by Arthur L. Dawe, Consolidated Paper Corp., Montreal, was presented to Dr. J. N. Swartz of Howard Smith Paper Mills Ltd., Cornwall, Ontario. This medal was awarded to Dr. Swartz for his paper on "Bleaching of Sulphate Pulp," the award being made to him as the senior member of the section submitting the best paper presented at the 1946 annual meeting.

Technical Section's New Officers for Ensuing Year

In the election of officers for the Technical Section, R. J. Askin, manager of mills, Abitibi Power and Paper Company, Toronto, was chosen as chairman for 1947. In addition, John Buss of Provincial Paper Ltd., Toronto, and Gordon A. Franklin, E. B. Eddy Company, Hull, Quebec, were elected as councillors for a three-year term; and Charles E. Turner, Building Products Ltd., Montreal, as councillor for a two-year term.

Formal Papers Presented

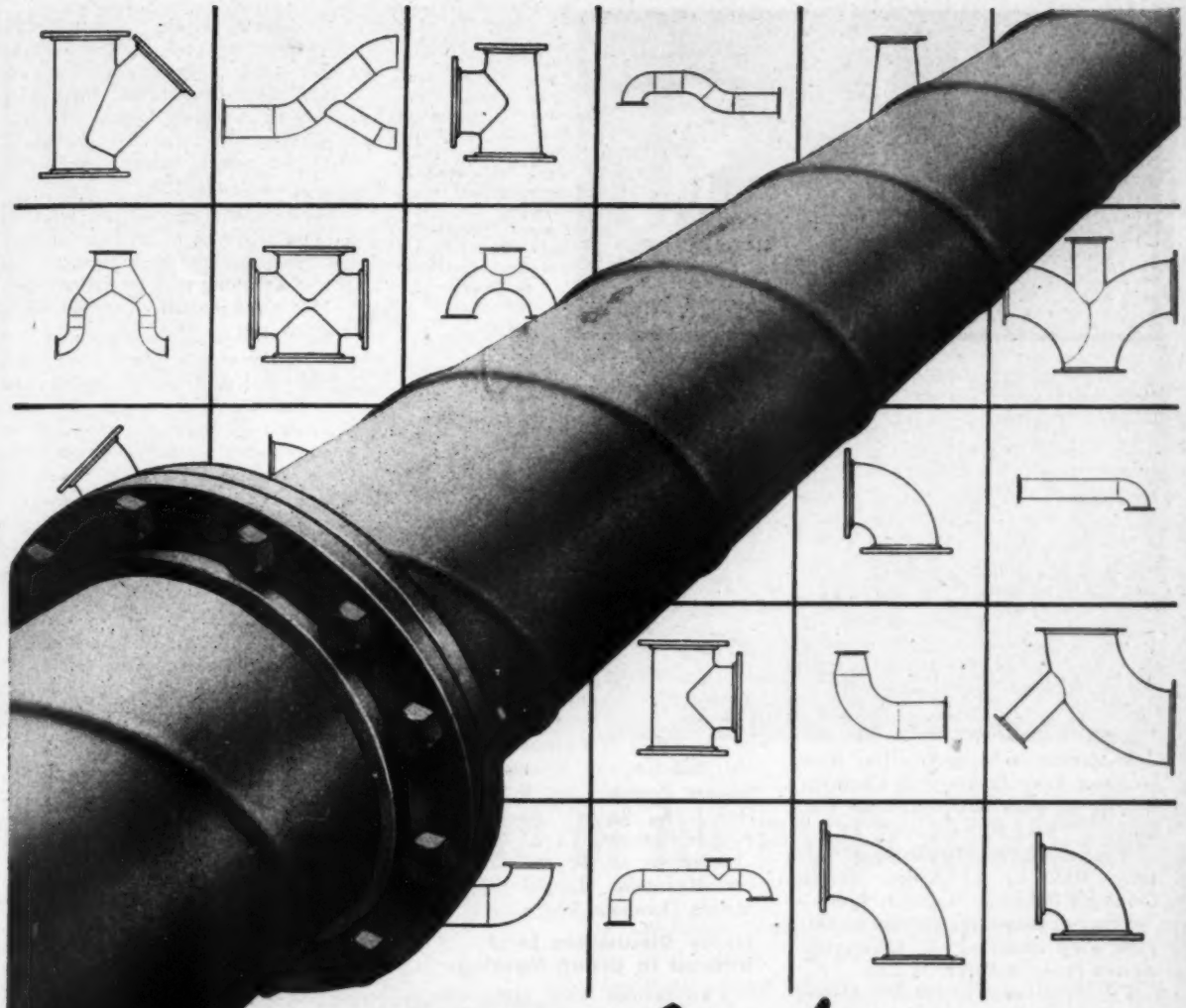
The subjects of the various technical papers which were presented at the meeting together with the respective author or authors of each of them follow:

Slime Control at Anglo-Canadian, J. W. Wing, Anglo-Canadian Pulp & Paper Mills, Ltd.

Newsprint Quality—Today and Tomorrow, Dr. G. L. Larocque, *New York Daily and Sunday News.*

Paper Moisture Control, E. L. Neal, Anglo-Canadian Pulp & Paper Mills Ltd.

The Physics of Water Removal, Dr.



TAYLOR *Spiral Welded* PIPE

• That spiral welded seam gives Taylor Spiral Pipe greater strength, gauge for gauge, than any other type of pipe. The combination of rugged strength, light weight and low installed cost make it ideal for a wide range of services in mill, mine, quarry and pit. ☆ ☆ ☆ Sizes, 6" to 42". Thicknesses, 12 to 8 gauge. All types of end joints, fittings, and fabricated assemblies.

Taylor Forge & Pipe Works

General Offices and Works: P. O. Box 485, Chicago • New York Office: 50 Church Street
Philadelphia Office: Broad Street Station Building • Los Angeles Office: Oviatt Building

Dr. J. A. Van den Akker, Institute of Paper Chemistry (left); F. J. Giffen, chairman of session on second morning of convention; Dr. W. Boyd Campbell, Pulp and Paper Research Institute of Canada

W. Boyd Campbell, Pulp and Paper Research Institute of Canada.

Uses of Kraft Pulp, A. G. Durgin, Brompton Pulp and Paper Co. Ltd.

Canadian Tall Oils—Their Composition and Potential Uses, Dr. R. V. V. Nichols, McGill University.

Kraft Brown Stock Refining, G. F. Allo, Bathurst Power & Paper Co. Ltd.

Improvements and Extensions of Sulphite Facilities at Price Brothers & Co. Ltd., Riverbend, H. J. Barratt and H. H. Sears, Price Brothers & Co. Ltd.

Some Observations on Cooking and Acid Making Problems Resulting from Increased Chip Packing. A Christensen, Spruce Falls Power & Paper Co., Ltd.

What Constitutes the Desirable Sulphite Mill, L. C. Kelley, British Columbia Pulp and Paper Co. Ltd.

Effect of Secondary Factors in Sulphite Pulp Bleaching, V. Oleskevich, Abitibi Power & Paper Co. Ltd.

The Application of Electric Motors to the Pulp and Paper Industry, W. Eliason, The Ontario Paper Co. Ltd.

The Amplidyne Paper Machine Drive at Donnaconna, D. G. P. Sanderson, Donnaconna Paper Co. Ltd.

Fluid Drives for Pulp and Paper Machinery, R. D. O'Neil, American Blower Corporation.

An Analysis of the Hydraulic Method of Barking, G. Goumeniouk, Powell River Co. Ltd.

The Carlsson Printability Test for Newsprint, J. H. Bardsley, St. Lawrence Paper Mills Co. Ltd., and L. J. Morin, Consolidated Paper Corp. Ltd.

The Measurement of Printing Smoothness, S. M. Chapman, Pulp and Paper Research Institute of Canada.

The Instrumentation Program at the Institute of Paper Chemistry, Dr J. A. Van den Akker, Institute of Paper Chemistry.

A Method of Evaluating the Unbeaten Strength of Unbleached Chemical Woodpulp, N. S. Grant, Spruce Falls Power & Paper Co. Ltd.

The Drying of Paperboard, A. E. Montgomery, J. O. Ross Engineering Corp.

Paperboard Manufacture in Scandinavia, C. Bergendahl, Inlands Aktiebolag (Lilla Edet, Sweden).

The Stapley Pulper, S. Stapley, Provincial Paper Ltd.

Evaluation of Stock Preparation Equipment, G. H. Vickery, E. D. Jones & Sons Co.

The Longitudinal Grinding of Wood, W. H. de Montmorency, Pulp and Paper Research Institute of Canada.

Study of Burr Penetration, C. T. Robinson, Consolidated Paper Corp. Ltd.

The Effect of Certain Variables in the Bleaching of Groundwood with Sodium Peroxide, W. E. Stobo and Dr. J. K. Russell, Anglo-Canadian Pulp & Paper Mills Ltd.

Principles in the Design of Modern Hydraulic Machinery, John H. Maude, Dominion Engineering Works.

Lively Discussions Lend Interest to Group Meetings

Two periods were given over to Sulphite Group discussions. The first period included the presentation of informal papers and a discussion on the sulphite pulping of various wood. Scheduled on the program of this session were W. H. Birchard, Fraser Companies, Ltd., and Alex Johnson, Provincial Paper Ltd., for the subject of hardwoods, and Dr. J. Edwards, Price Brothers & Co. Ltd., for the subject of slabwood.

The second discussion period of the *Sulphite Group* took up the operation of indirect heating systems. Discussion evolved around questions pertaining to liming, chip packing, condensate, side relief, cleaning lime from heaters, heater construction, blowing clean, desuperheaters, and top spray nozzles.

A discussion of the manufacture of kraft papers, led by A. J. Philip, Canada Paper Company, and a discussion of alkaline pulping research at the Pulp and Paper Research Institute of Canada, led by John S. Hart, constituted the program of the discussion period devoted to the *Alkaline Pulping Group*.

The program also included two periods for group discussions on fine papers; two, on board; and two, on engineering. In addition, there were other single periods which were devoted to wood chemistry, newsprint, heat and power, waste, mechanical pulping, and standards.

Headbox design was the topic of the first of the two *Fine Papers Group* discussion periods; wet strength papers, and refining with special reference to high speed jordans, of the second.

Scheduled on the program of the first sitting of the *Board Group* was an informal paper by G. M. Hamblet of Hamblet Machine Co. Likewise, there was a discussion of numerous questions on dry end operation. This latter feature was carried over for completion to the second sitting of the group. The questions concerned sheet cutting, calender stacks and applications, cutting and winding, general-equipment, and general-miscellaneous.

Here are a few of the questions that were presented for consideration:

What types of drivers are now used for high speed board machine cutters?

What are the maximum number of cuts per minute?

How is the sheet inspected at speeds of 275-300 fpm?

What makes cutter slitter knives waver?

What is the proper crown, if any, to carry on the various calender stack rolls?

Have chromium plated calender rolls been found to give complete satisfaction? Wet and dry stacks? Does their use tend to improve the finish of the sheet?

For what reason are calender rolls bored for steam? What is the effect on the sheet?

What materials besides wood are used to make water boxes?

What governs the inside dimensions of the water box and what are considered the ideal dimensions?

Are air jets used at box ends to prevent sticking at calender roll?

What methods are used to remove fluff, felt hairs, etc., from the surface of the sheet? Are there any devices, such as brush, blower or suction box used to remove loose surface particles at the dry end? Where are these units located?

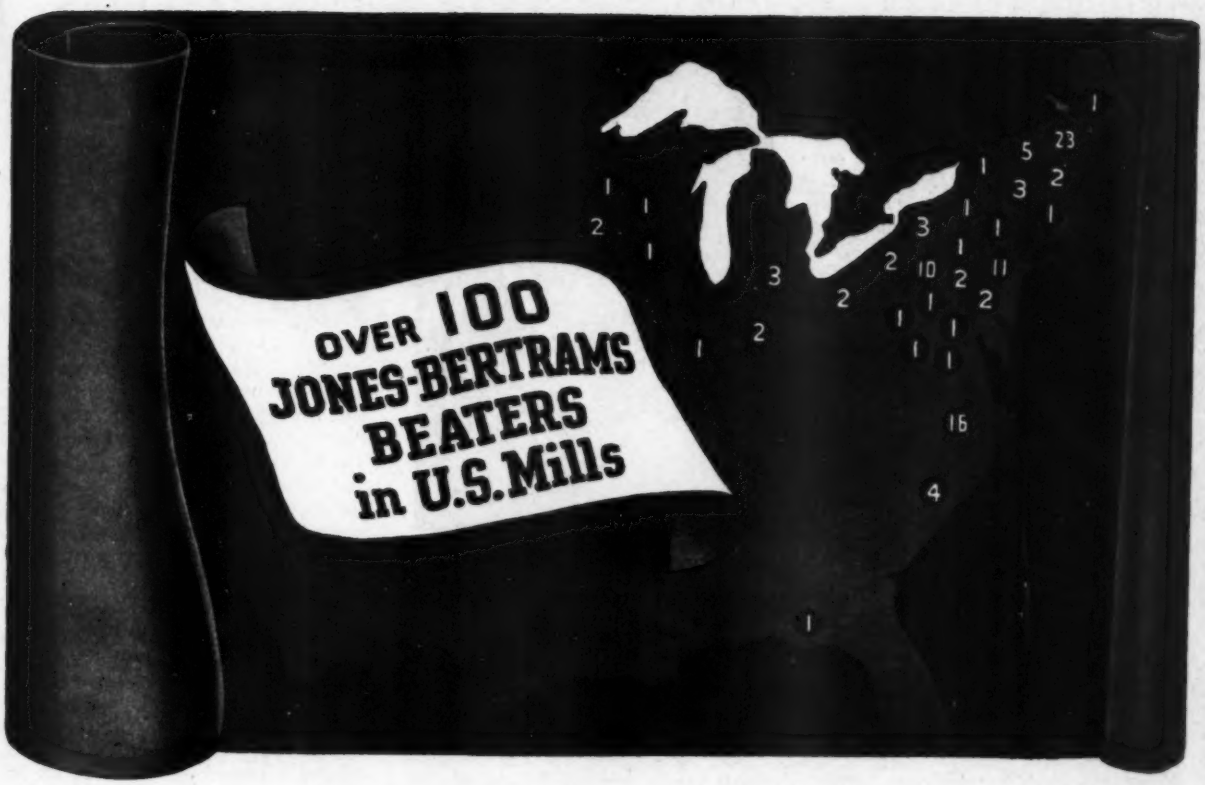
What is the experience with stainless steel cylinder facing wires?

What is the latest development in cylinder vat design for high grade board?

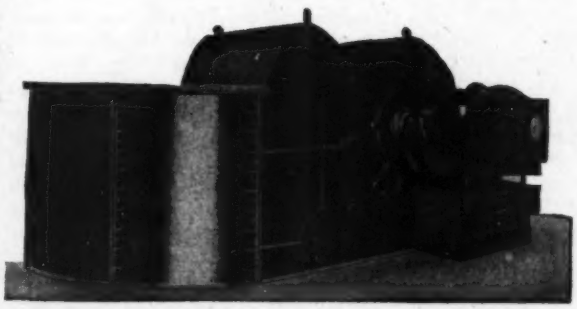
What materials are used for felt washing?

Does increase in speed over 200 fpm detract from finish and formation?

What are the contributing causes



THE STANDARD BEATER OF THE PAPER INDUSTRY



The satisfactory results of the Jones-Bertrams Beater have been evidenced in mill after mill:

UNIFORM FIBRE TREATMENT — Practically 100 per cent circulation is accomplished, thereby producing uniformly refined fibres.

SHORT BEATING CYCLE — Roll and bedplate design results in producing a great amount of work in a very short time.

AUTOMATIC CONTROL — Duplication of beating cycles assured by automatic adjustment and control of roll setting.

LOW H. P. PER TON — Highly efficient utilization of horsepower.

FLOOR SPACE SAVING — Replaces three, four, or more regular Hollanders.

In the event that you have not already investigated all the advantages of the Jones-Bertrams Beater, we will be pleased to give full particulars.

UNIFORM FIBRE TREATMENT
SHORT BEATING CYCLE
AUTOMATIC CONTROL
LOW H. P. PER TON

Jones

E. D. JONES & SONS COMPANY, Pittsfield, Mass.
Builders of Quality Machinery for Paper Mills.

of excessive shrinkage in the finished board after it has been delivered to the customers' plant?

The two discussion periods given over to engineering were programmed to include a subcommittee report on equipment layout for an ideal groundwood mill and a deliberation on the economics of grinder room modernization.

W. W. Holland, Quebec North Shore Paper Co., was the scheduled leader of the session covering groundwood mill layout; while representatives of Powell River Co. Ltd., Price Brothers & Co. Ltd. (Kenogami), Donohue Brothers Ltd., and Ontario Paper Co. Ltd. were scheduled for leading the discussion on economics of grinder room modernization.

The program of the *Wood Chemistry* meeting included two papers:

Preparation and Sulphite Pulping of Per-iodate Lignin, by P. Ritchie, Pulp and Paper Research Institute of Canada; and

A Fractional Precipitation Method for the Determination of Cellulose Polymolecularity, by John E. Tasman and Dr. A. J. Carey, Restigouche Co. Ltd. These presentations were followed by a discussion of the fundamental research program at the Pulp and Paper Research Institute of Canada, by Dr. C. B. Purves and his students.

Two major subjects were on the program of the *Newsprint* meeting.

D. B. Foss, Consolidated Paper Corp., Ltd. (Grand Mere), was listed as the leader for the deliberations on the double suction couch; H. R. Davidson, Great Lakes Paper Co., on slime control.

K. R. Swinton, RCA Victor, presented an informal paper on high frequency heating before the *Heat and Power Group*. The program of this session also included a discussion of replies to questionnaire on back tender rope and dryer felt life.

The subject of discussion before the Waste meeting was utilization of fiber from waste wood; that of the Standards meeting, physical and chemical standards used in the pulp and paper industry. Emphasis in the *Waste Committee Group* discussion was placed on the Bauer Pulper, the Allis-Chalmers Defiberizer, and on chips from purchased slabs.

The *Mechanical Pulping Session* was devoted to a discussion of experimental grinding of jack pine and poplar, and to consideration of general questions of groundwood manufacture.

This splendid meeting of the Technical Section of the Canadian Pulp and Paper Association as per custom was only one of three meetings that were held simultaneously at the Mount Royal Hotel. The other two conventions were the thirty-fourth annual meeting of the Canadian Pulp and Paper Association, and the twenty-ninth annual meeting of the Woodlands Section of the Canadian Pulp and Paper Association.

Bernard W. Burgess, newly-appointed technical assistant of the Technical Section of the Canadian Pulp and Paper Association

Cadman Resigns

The resignation of A. E. Cadman as general manager of the Canadian Pulp and Paper Association, and the appointment of his successor, F. L. Mitchell, O.B.E., Deputy Coordinator of the pulp and paper administrations of the Wartime Prices and Trade Board, was announced on the last day of the meetings at the annual luncheon of the Canadian Pulp and Paper Association.

Mr. Cadman has been with the Association for the past 25 years, and now following his resignation as general manager and preliminary to his retirement at a later date, he will continue to serve the Association in various phases of its activities.

Mr. Mitchell has been engaged for many years in various branches of the industry, and brings to his new post a wide experience and knowledge of pulp and paper operations.

President Fowler Speaks At Luncheon Meeting

At this same luncheon, R. M. Fowler, president, Canadian Pulp and Paper Association, presented his annual report. In part, he said:

"I would like to first pick out a few salient developments of the past year and then go on to examine some of the problems that are facing the industry today, and possibly make some suggestions for the future.

"At the annual meeting a year ago a major step in organization was taken when the Canadian Pulp and Paper Association assumed the functions and responsibilities of the former joint executive board of the two associations. I believe the year has shown that that step was a wise one. The merger has worked well. The expanded executive board of CPPA has met eight times and these meetings have been well attended by the senior executives of the industry who comprise the board. The work formerly done, with considerable duplication, by CPPA and the joint executive board has been done by one body, at substantially the same cost as CPPA alone had involved. There was both increased efficiency and substantial saving in expense to the industry. Many decisions of importance and discussions of great value have taken place at the meetings of the executive board.

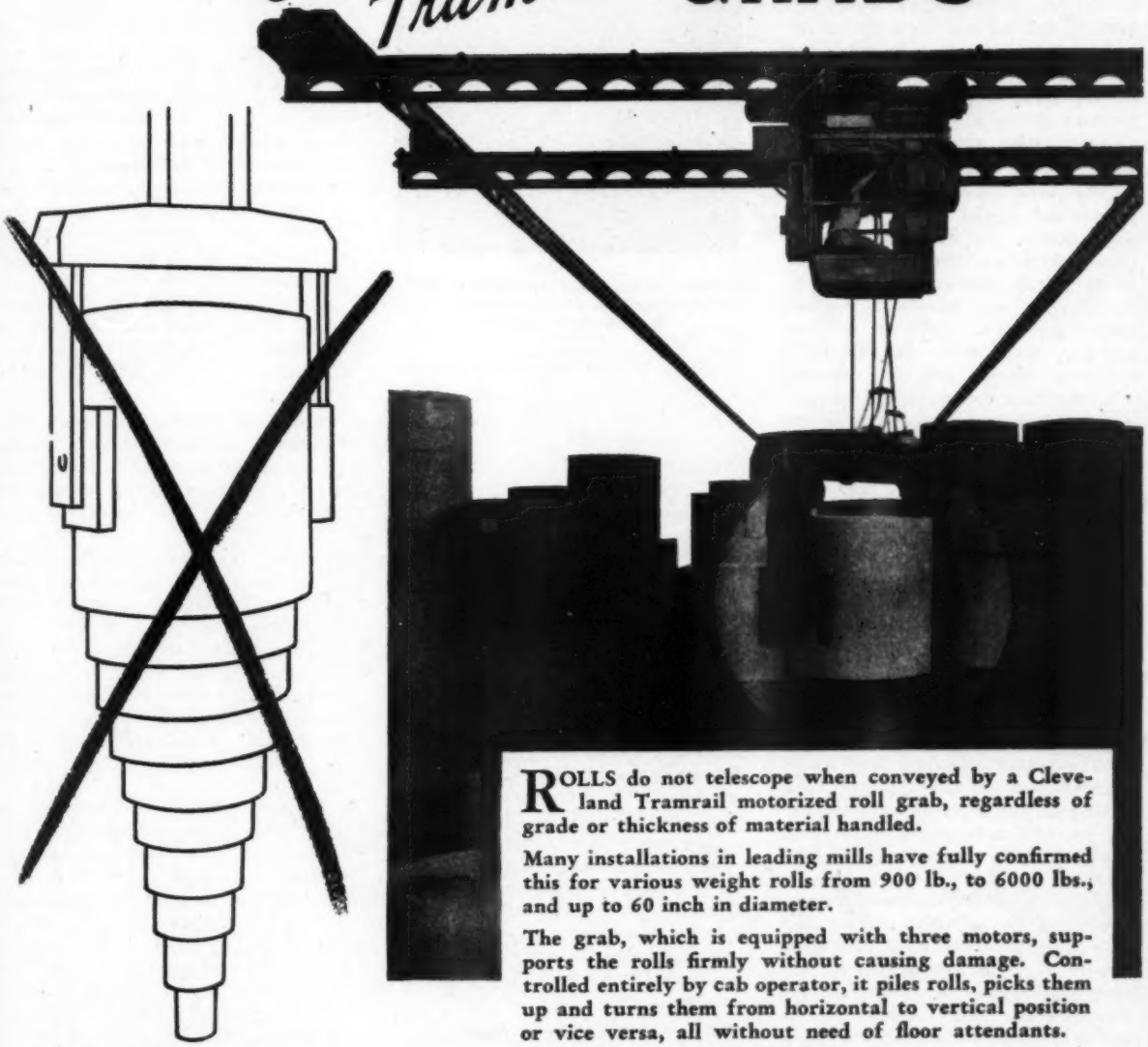
"A few days ago, the members were notified of Mr. Cadman's resignation as general manager and the appointment of F. L. Mitchell as his successor. Some months ago Mr. Cadman told me that, after twenty-five years in the service of the Association, he would be pleased if plans could be made for his retirement. He was willing to postpone his request for relief from responsibility until Mr. Mitchell's wartime duties would permit him to give adequate time to Association work. I am glad to say that Mr. Cadman will continue for a time to discharge a number of specific tasks for the Association and to assist Mr. Mitchell in taking over his duties.

"Of particular interest was the formation, during the year, of two new sections—the Logging Mechanization Section, designed to co-ordinate and press forward with the development of mechanization projects in the woods; and the Industrial Relations Section (which has had a most auspicious beginning), which is charged with responsibility for collecting and analyzing labor statistics and information on labor matters within the industry.

"In line with the policy of eliminating wartime activities when the need for them has passed, the Wartime Machine Shop Board has been completely wound up. Its work was completed; its assets liquidated, and its accounts audited. A week ago, the Association remitted to the government of Canada the balance on hand after payment of all expenses. The final check was for $53,837.99 which, when added to previous remittances of $175,000, represented a total payment of nearly $230,000 to the Canadian Government from this nonprofit war service by the Industry.

"The question persistently arises—

No Telescoping Rolls *with* *Cleveland Tramrail* GRABS



ROLLS do not telescope when conveyed by a Cleveland Tramrail motorized roll grab, regardless of grade or thickness of material handled.

Many installations in leading mills have fully confirmed this for various weight rolls from 900 lb., to 6000 lbs., and up to 60 inch in diameter.

The grab, which is equipped with three motors, supports the rolls firmly without causing damage. Controlled entirely by cab operator, it piles rolls, picks them up and turns them from horizontal to vertical position or vice versa, all without need of floor attendants.

GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
7002 EAST 287TH ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

and it is a question of national as well as of selfish importance—where are we heading? What does the future hold? We are busy today, and reasonably properous—how long will it last? . . .

"I seem to detect throughout the industry a feeling of insecurity about the present well-being of the pulp and paper business—a rather widespread belief that we have only a short period of sunshine in which to make hay. Such an attitude may have the advantage that it prevents a business man from becoming over confident, but it has the great danger that he is likely to make decisions for short-range advantage rather than for long-range good. . . .

"We have come through the war period and, despite many difficulties and problems, the Canadian pulp and paper industry is stronger today than it was at the beginning of the war. Its efficiency has increased; without great expansion of plant and machine capacity, productivity has materially increased through improved efficiencies. A recent survey by the Association of prospective capacity changes shows that practically every branch of the industry is planning substantial increases in production in 1947 over 1946. This year there will be nearly 200,000 tons more newsprint made than in 1946, more than 25,000 tons more fine papers, book papers and printing papers, over 50,000 tons more paperboard, 70,000 tons more mechanical pulp, and over 30,000 tons more chemical pulp (apart from dissolving and soda pulps). Further substantial increases in production are planned by this industry for 1948 and 1949, to meet expected demands on Canada. These figures indicate that the Canadian pulp and paper industry is making ready to meet reasonable levels of world demands upon it. Those demands have materially and, I think, permanently changed, since the beginning of the war. New uses for pulp and paper products have developed; new usage habits have grown up; literacy throughout the world is moving rapidly ahead; and Canada's role in world supply has materially expanded.

"I believe, most sincerely, in the future of this industry. I think we have reached the time when forest holdings are no longer available for the support of completely new producing units. But there is room for steady growth and development of existing units through improved mechanical equipment, better management of resources and imaginative marketing policies. It is no doubt true that this industry cannot hope to escape the effect of either a world depression or a stifling of international trade. But, short of such calamities, I can see no reason why the present Canadian industry should not continue indefinitely to supply its share of the expanded and expanding needs of the world for pulp and paper products."

Douglas Jones, secretary-engineer of the Technical Section of the Canadian Pulp and Paper Association

New Officers Elected By Canadian P. & P. Ass'n

The Canadian Pulp and Paper Association also announced the following officers for its executive board for 1947:

Chairman—S. L. deCarteret, vice president and general manager, Canadian International Paper Company, Montreal, P. Q.

Vice Chairmen—Aubrey Crabtree, president, Fraser Companies Limited, Edmundston, N. B.; R. L. Weldon, president, Bathurst Power and Paper Co., Ltd., Montreal, P. Q.

Honorary Vice Chairmen—C. R. Whitehead, vice president, Consolidated Paper Corporation, Limited, Montreal, P. Q.; Hugh M. Lewis, executive vice president and managing director, Sorg Pulp Company Limited, 901 Royal Bank Building, Vancouver, B. C.

Sectional Chairmen Make Reports to Association

Briefs from reports of the chairmen of the several sections making up the membership of the Canadian Pulp and Paper Association covering activities of the pulp and paper industry of Canada during 1946 and of the activities of the Individual section of the Association in particular, follow:

Board Section—E. A. Smith, chairman. Although confronted with many raw material shortages and handicapped through strikes outside the industry which naturally affected the supplies of the board mills, careful planning and speeding up of production made it possible to exceed the 1945 all-time high for paperboard production.

During the year a compilation of trade customs presently in effect by manufacturers of paperboard was made, printed and distributed.

Forward steps have also been taken to produce proper testing methods to insure highest degree of quality in the products made by the board mills.

Wrapping Paper Section—J. O. Chenevert, chairman. Despite additional domestic demands for kraft wrapping for the manufacture of heavy duty bags for food, rock products, chemicals, fertilizers, etc., by increased production, the demand for wrapping papers from the various sources in the domestic market, as regulated by the Wartime Prices and Trade Board, was met.

Subject to the signs on the horizon of the possibility of some recession in trade generally, the indications are that the present level demand will continue in the year 1947.

Book and Writing Section—G. W. Earnshaw, chairman. During 1946, a greater quantity of book and writing paper was manufactured and distributed in Canada than at any previous time.

Making available for sale in Canada a maximum quantity of paper continues to be the most important object of the mills.

During the year 1946, the mills have encountered difficulty securing chemicals and other essential material owing to strikes, while the shortage of lumber, wrapping paper and other packaging material continues to present a problem.

Specialty Papers Section—R. B. Hall, chairman. During 1946, production of grades coming under this section increased considerably and while it was not possible to meet entirely all demands, nevertheless the essential requirements of the Canadian market were supplied and export shipments maintained to those countries having an established position with the respective mills.

It is expected that during 1947 some additional tonnage in certain grades will be available, to augment the present production.

During the year 1946, total production of chemical pulp in Canada increased about 13 per cent over year 1945.

Shipments of chemical pulp from Canada represented about 68 per cent of United States imports as compared with 24 per cent during the immediate prewar years.

All Canadian Government controls on exports were eliminated commenc-

Easier way to better piping
...CRANE Supplies Everything

Why do it the hard way when you can simplify every step of piping jobs—from design to erection to maintenance work. Specify Crane equipment—the truly complete line that not only includes everything you need, but assures the quality you want in every item.

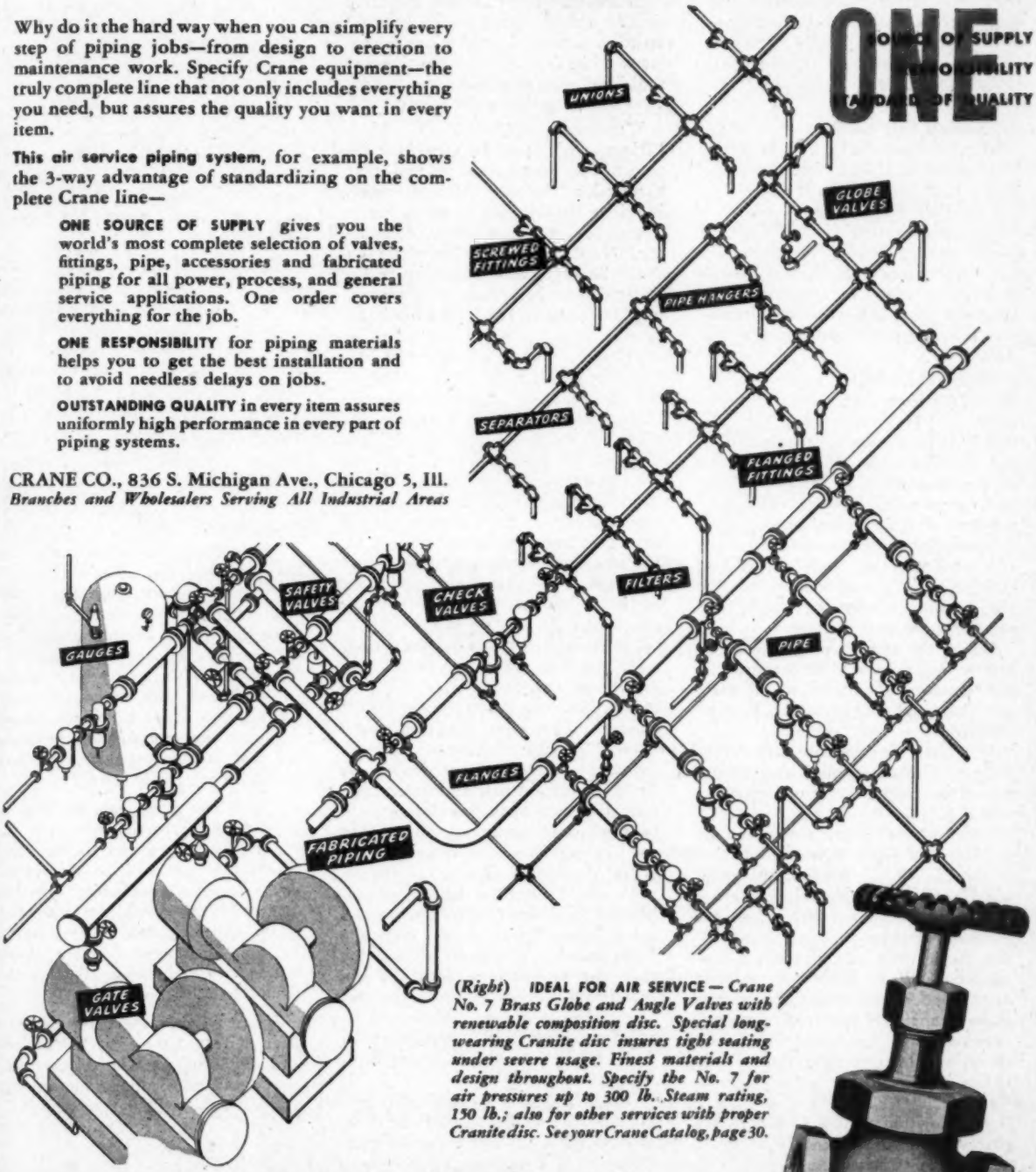
This air service piping system, for example, shows the 3-way advantage of standardizing on the complete Crane line—

ONE SOURCE OF SUPPLY gives you the world's most complete selection of valves, fittings, pipe, accessories and fabricated piping for all power, process, and general service applications. One order covers everything for the job.

ONE RESPONSIBILITY for piping materials helps you to get the best installation and to avoid needless delays on jobs.

OUTSTANDING QUALITY in every item assures uniformly high performance in every part of piping systems.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



(Right) **IDEAL FOR AIR SERVICE** — *Crane No. 7 Brass Globe and Angle Valves with renewable composition disc. Special long-wearing Cranite disc insures tight seating under severe usage. Finest materials and design throughout. Specify the No. 7 for air pressures up to 300 lb. Steam rating, 150 lb.; also for other services with proper Cranite disc. See your Crane Catalog, page 30.*

EVERYTHING FROM . . .

VALVES • FITTINGS
PIPE • PLUMBING
HEATING • PUMPS

CRANE

FOR EVERY PIPING SYSTEM

ing January 1, 1946; but were retained as to tonnage allocations and prices for consumption within Canada.

Government controls in United States governing the quantities and respective grades consumers there could accept from Canadian shippers terminated October 1, 1945; but maximum prices consumers could pay remained in effect until November 10, 1946.

Chemical Pulp Section—F. G. Robinson, chairman, and J. O. Chenevert, vice chairman. In November, the Association issued under the title "Wood Pulp Supply from Canada" a factual presentation of the extent to which Canada's exports of wood pulp have grown since the prewar period, so bringing about an important shift in world pulp supply and its distribution from respective producing countries.

Mechanical Pulp Section—E. J. Thom, Chairman. Output of groundwood in 1946 was twenty per cent greater than the amount made during the previous year. Because of increased quantities of pulpwood the mills were able to make ninety-one per cent of their normal production.

Newsprint mills consumed all of the additional pulp they made and reduced their sales of groundwood to all but the domestic market to which they supplied additional tonnage.

While the market pulp mills used greater quantities of their output, they also increased shipments to all markets, but particularly to U.S.A. consumers.

It is interesting to note that during the year Canada supplied over 95 per cent of the total groundwood imported into U.S.A.

Joint Administrative Committee of the Pulp and Paper Research Institute of Canada—R. L. Weldon, chairman, and Dr. O. Maass, general director.

The Sixth Annual Report of the Institute describes in detail its activities during the year beginning September 1, 1945, and ending August 31, 1946. As this was the first year almost completely free from war work since the new agreement came into effect, the Institute was able to add to its staff and the variety of its studies.

A fellowship valued at $1,000 per year was donated to the Institute by Shawinigan Chemicals, Limited, to promote research on the unsaturated esters of cellulose. The Institute is now conducting studies under five such grants, the other four being the Brown Corporation Fellowship, the Canadian Industries Limited Fellowship, the D.S. and R. H. Gottesman Foundation Scholarship, and The Sylvania Division, American Viscose Corporation, Fellowship. It is a pleasure to acknowledge the generosity and breadth of vision of the donors of these grants who are willing to invest thus in the future of the industry.

In order that the increasing activities of the Institute could be adequately supported, the Government increased its financial contribution and additional requirements of the budget were met from the reserve fund.

Woodlands Section—R. G. MacFarlane, chairman. In presenting his report, Mr. MacFarlane related that the Section held its first summer meeting since 1939, July 9 to 11 on Fraser Companies' operations, near Edmundston, N. B.; that the Committee on Aerial Surveys under the chairmanship of Gordon Godwin, held its first meeting December, 1946, attended by many of the recognized authorities on aerial photography in Eastern Canada; that the Committee on Training of Woods Labor and Personnel, under the chairmanship of R. S. Armitage, has made an auspicious start toward the solution of its problems; that the Committee on Nutrition of Forest Workers has been formed under the chairmanship of J. W. Patterson; and that the Logging Sleigh Committee has arranged for the preparation of a light sleigh and this unit will be tried on Price Brothers' operations during this winter.

He also stated that, in collaboration with the Committee on Forest Fire Protection, two books were published by the Section: *Forest Fire Fighters' Guide*, by E. L. Howie and *Conference Leaders' Manual for Conducting Forest Fire Fighting Conferences*, by T. M. Pond; and that an instructional film strip on "Buck Saw Filing" had been prepared under the auspices of the Cutting Tools Committee.

Mr. MacFarlane likewise covered the work which has been done in formulating a statement of recommendations for a Forest Policy of the Pulp and Paper Industry of Canada, mentioning that the Executive Council of the Woodlands section approved the recommendations of the task committee and forwarded them to the Executive Board of the Canadian Pulp and Paper Association.

The Woodlands Section, continued Mr. MacFarlane, has co-operated closely with the Pulp and Paper Research Institute of Canada in its woodlands research projects.

In concluding his report, Mr. MacFarlane made reference to the Woodland section awards which were presented to their respective recipients at the Woodlands section luncheon on January 29.

The J. A. Bothwell award—medal and $100—went to E. L. Howie, Fraser Companies, Ltd., for his booklet, Forest Fire Fighters Guide—the best paper on forest conservation.

The Price Brothers & Co. award—$100 for the best paper on subjects other than logging mechanization—was presented to Ivar F. Fogh, Canadian International Paper Co., for his paper Log Flumes as an Aid in the Driving of Small Streams.

The Ontario Paper Co. award—$100 and scroll or fob—was won by J. A. Michaud, Consolidated Paper Corporation, Ltd., for his paper, A Pulpwood Loading Plant for Rail Shipment—the best paper on logging mechanization.

The Ellwood Wilson award, a plaque donated by Brown Corporation, went to G. F. Randolph, Brown Corporation, for the best industrial application of Woodlands Section study or project—Organization of Woods Labor Training.

Egon Glesinger, Forest Products Branch, Food and Agricultural Organization of United Nations (Washington, D. C.), was guest speaker at the annual luncheon of the Woodlands Section.

Emphasizing his conviction that democracy depends upon a free press, Dr. Glesinger pointed out that Canada now supplies three out of every five newsprint pages printed throughout the world. "Since you can't have a free press without newsprint," he said, "it is obvious that, without Canada's contribution, the democratic standards that exist throughout the world, and the cultural standards as well, would be materially lower."

"With the many valuable uses for wood products, particularly pulp, that are already known and the thousands which I believe will be discovered," Dr. Glesinger concluded, "the day may not be too far distant when Canadians will look upon their forests as not only their most valuable resource but more valuable than all the rest of their resources combined."

W. A. Delahey, executive vice president, Great Lakes Paper Company, Ltd., Toronto, was named chairman of the Woodlands Section Council at the convention. J. W. Paterson, E. B. Eddy Co., Hull, P. Q., is vice chairman.

▶▶▶ The importance of the three-day meeting of the Canadian Pulp and Paper Association and its two affiliated groups—the Technical Section and the Woodlands Section—was stressed in an editorial appearing in the January 29, 1947, issue of *The Montreal Daily Star* under the caption "Our Greatest Industry."

Too many cooks spoil the broth...

YES SIR—and too many cookings spoil the best of papers and boards. After your raw materials have been *boiled* to pulp and washed clean it is just silly to *fry* them to a frizzle at the drier rolls.

How get rid of the water?

That's easy! PRESS it out on a Hamilton Felt. The moisture that remains in the sheet after it has left the Hamilton Felt will be evaporated without being heated to the frying point.

Finished product will be better formed, too, and the saving in the cost of fuel will amount to many times the price of the felt.

• From the thinnest tissue to the heaviest board there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

•
Miami Woolen Mills
•

Hamilton Felts

•
Established 1858
•

Pacific Section of TAPPI Holds Midwinter Session

▶▶▶ MORE THAN 120 members of the Pacific Section of the Technical Association of the Pulp and Paper Industry gathered in Longview, Washington, January 14 for the midwinter session of the Association.

The technical part of the program, a panel discussion of kraft bleaching, was held at the Longview Women's Club building during the afternoon.

Following the business session, the members adjourned to the Hotel Monticello for a dinner meeting. The entertainment feature was an industrial film, "Sulphur in Industry," followed by one in lighter vein, "Football Highlights of 1946."

Following the dinner, a panel was formed with R. S. Hatch, research director of the Longview Pulp Division of Weyerhaeuser Timber Company, as moderator. Featured on the panel were the following speakers and topics: "The Fundamentals of Kraft Bleaching," Dr. J. L. McCarthy, University of Washington Department of Chemistry; "The 'hocus pocus' of Kraft Bleaching," Paul Billington, Research Department of the Longview Pulp Division, Weyerhaeuser Timber Company; and "Some Exotic Bleaching Solutions," Dr. Walter Holzer, Crown Willamette Div., Camas.

It was pointed out by Mr. Hatch that there are more methods of bleaching kraft than there are mills performing the operation, with wide variations in the order in which steps are accomplished.

Mr. Billington discussed three main variations of the bleaching process. Dr. Holzer told of bleaching agents other than chlorine and its derivatives, which Mr. Hatch termed the exotic bleaches, which are used mainly as a topping stage after the usual bleaches have been applied.

Paul E. Barr, of Rayonier, Inc., Hoquiam, Washington, delivered a paper in the annual Shibley Award competition entitled "Experiences with Sodium Aluminate in Papermaking."

During the discussion period which followed the paper by Mr. Barr, he stated that his company used Alcoa 680 which provided 85 per cent sodium aluminate with 57 per cent available alumina completely soluble. During the experiments, Mr. Barr stated 30 pounds of resin per ton of paper was used and maintained as a standard for the tests. He said that no tests have been completed on the permanency of sizing under the sodium aluminate methods outlined by him. The tests were completed in October, last year, and the permanency tests have not yet been run although Mr. Barr's department plans to carry on such tests in the future.

According to Mr. Billington, the

General view of crowd at TAPPI meeting in Longview (Wash.)

LEFT—R. S. Hatch, of Weyerhaeuser Timber Company, Longview (left) was moderator of a panel discussion on kraft bleaching. Paul Billington (center), of Longview, was one of the speakers. At the right is Dr. Walter Holzer, of Camas (Wash.), also a speaker. RIGHT—Dr. J. L. McCarthy (left), was one of the panel speakers. At the right is Harold Wall, of Longview, chairman of arrangements

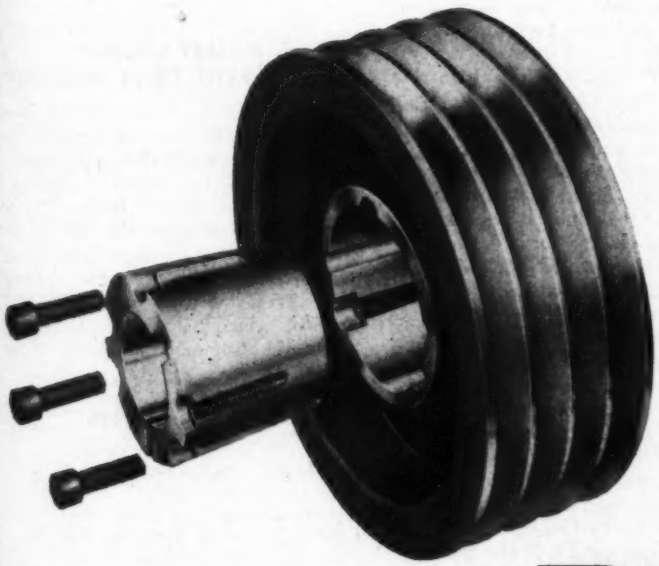
Complete unit. Slip it on, line it up and tighten while sighting.

The simplest, surest mechanism ever devised for holding wheels to shafts.

TAPER-LOCK BRAND

A New Cost-Saving Taper Bore Sheave

Holds fast to the shaft with firmness equivalent to a shrunk-on fit.



Disengages with less effort than any other sheave. Easy on. Easy off.

Complete range of sizes in Dual Duty (A and B); B, C and D grooves.

DODGE

of Mishawaka, Ind.

For details about cost-saving developments in power transmission equipment, call the Transmissioneer—your local Dodge distributor. He's factory-trained, qualified to suggest ways to improve machine performance and increase production. Look for his name under "Power Transmission Equipment" in your classified telephone directory.

DODGE MANUFACTURING CORP., MISHAWAKA, INDIANA

Copyright, 1947, Dodge Mfg. Corp.

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, ETCHING COMPANY OF AMERICA, 1520 MONTANA STREET, CHICAGO 14, ILLINOIS

G. H. Gallaway, of Crown Willamette Division, who was chairman of the session

two major sequences of processes used in this country are:

Type 1, chlorination, a hot caustic extraction and the hydrochloride bleach;

Type 2, chlorination, a bleach, then the extraction and a final bleach;

Type 3, used extensively in Scandinavian mills, employs a prechlorination bleach and then goes through the three points of Type 1.

A study of tests of these three sequences have shown that Type 2 will bleach to a higher brightness than Type 1, reaching a brightness in the neighborhood of 85, Mr. Billington said. Experiments run on the chlorine percentages advocated by the Scandinavians in use of Type 3 have failed to produce a bleached kraft with less than the desired 10 per cent strength loss. Mr. Billington concluded that Type 1 has proved the least expensive method in laboratory tests, so far.

During the discussion, Mr. Hatch said that chlorinated lignin is very dark, especially if created by caustic extraction before the bleach, therefore making it more difficult to bleach by Type 1 to the degree of brightness made possible by Type 2.

Dr. Holzer concluded the panel with a discussion of various "exotic" bleaches many of which have been borrowed from the textile field for use in pulp.

Chairman of the session was G. H. Gallaway, technical supervisor of Crown Willamette Division at Camas. Harold Wall, of Longview, was chairman of arrangements.

Paul E. Barr of Grays Harbor Division, Rayonier, Inc., Hoquiam, Wash., presenting paper entered in the annual Shibley award competition

◆

JOINT GET-TOGETHER OF KALAMAZOO SECTION TAPPI AND MICHIGAN DIV. SUPTS.

The annual joint meeting of the Michigan Division of the American Pulp and Paper Mill Superintendents Association and the Kalamazoo Valley Section of TAPPI, was held January 16 at the Park-American Hotel in Kalamazoo, Michigan, with more than 300 members and guests attending. The meeting this year was the responsibility of the Kalamazoo Valley Section of the Technical Association and was provided over by Robert Mashburn, chairman of that section.

Mr. Mashburn introduced Peter J. Massey, general manager of the Bryant Division of the St. Regis Paper Company, who acted as toastmaster. Mr. Massey summarized the activities and aims of the two organizations and then called on George H. Gerpheid, president of Hawthorne Paper Company, who spoke in tribute to the late Jacob Kindleberger, founder of Kalamazoo Vegetable Parchment Company.

The principal speaker of the evening was Reuben B. Robertson, Jr., executive vice president of the Champion Paper and Fibre Company, Hamilton, Ohio. Speaking on the subject "The Human Side of Papermaking," Mr. Robertson touched on several phases of current personnel and labor problems which confront the industry. He said that " 'free enterprise' is fighting for its existence and that the United States is its last bulwark in the world . . . personal administration is today the most important of management's responsibilities, one of which top management cannot divest itself." Pointing out that management must change its attitude toward personnel, Mr. Robertson continued, "Even in our more successful companies, there has been a tendency toward tradition, caution, and conservatism. In this field we must now blaze new trails. Workers want adequate security, a fair share of the profits, job protection; in general, supervisors they can respect; information of the business they are connected with; hearing for their ideas; old age savings, and opportunity to advance."

Discussing wage structure, Mr. Robertson maintained that the system must be sound and be understood through job evaluation programs. "The use of incentives and group bonus plans are often a real stimulus to greater productivity if they are fair and carefully explained."

Mr. Robertson's talk was followed by a lively discussion period.

Among special guests were Homer Latimer, national president of the Superintendents Association and James Wise, national executive committeeman of TAPPI. E. T. A. Coughlin and Grover Keeth, past national presidents of the Suprintendents Association, were present.

◆

PETER J. MASSEY CHOSEN AS 15TH TAPPI MEDALIST

The Technical Association of the Pulp and Paper Industry announces that the fifteenth TAPPI gold medal will be awarded to Peter J. Massey, general manager of the Bryant Paper Company Division of the St. Regis Paper Company, Kalamazoo, Michigan.

The award will be made during Paper Week at the annual TAPPI luncheon which will be held February 27 at the Commodore Hotel, New York City.

◆

COMING EVENTS

April 28-May 1—Annual meeting of the Chamber of Commerce of the United States, Washington, D. C.

April 29-May 1—Second Annual Industrial Packaging and Materials Handling Exposition, at the Sherman Hotel. Chicago, Illinois.

May 22-24—Annual meeting of The American Pulp & Paper Mill Superintendents Association, at the Edgewater Beach Hotel, Chicago, Illinois.

May 22-31—Mid-America Exposition, at the Cleveland Public Auditorium, Cleveland, Ohio.

June 12-13—The American Society of Mechanical Engineers, Wood Industries National Conference, at Madison, Wisconsin.

Oct. 21-25—The Pacific Chemical Exposition, at the San Francisco Civic Auditorium, San Francisco, California.

STATED MEETINGS

Chicago Professional Paper Group meets the third Monday of each month at the Chicago Bar Association, Chicago, Illinois.

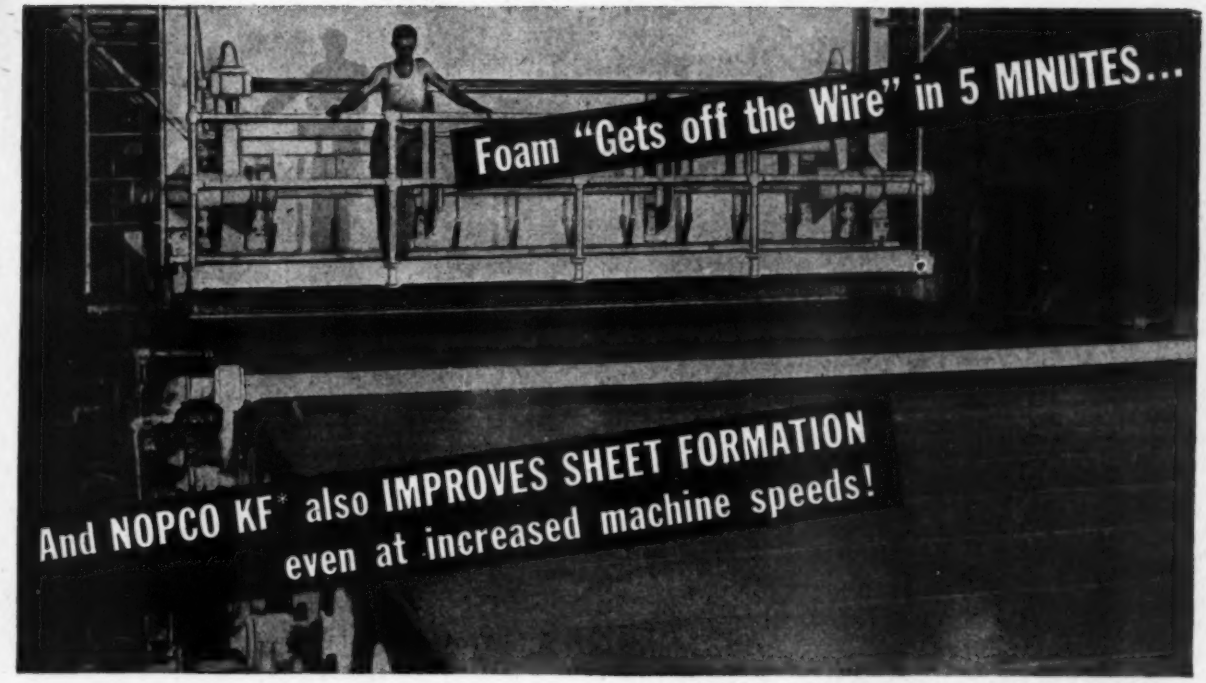


PHOTO COURTESY THE CHAMPION PAPER AND FIBRE COMPANY, HAMILTON, OHIO

Cutting foam in the head-box in two minutes—clearing all bubbles from the wire in five minutes—that's "all in the day's work" to NOPCO-KF, *super "bubble-buster." Other advantages. Improved sheet formation,* due to better fiber dispersion and foam control . . . *thin spots 75% eliminated* —their common cause (entrained air) dissipated as if stock were being handled at slow speeds, because NOPCO-KF keeps working on the wire . . . *more* paper produced with *less* cleanups around the machine . . . *breaks reduced . . . surface characteristics improved . . . water repellency materially increased.*

NATIONAL OIL PRODUCTS COMPANY
Boston • Chicago • HARRISON, N. J. • Cedartown, Ga. • Richmond, Calif.

NOPCO-KF

SUPER "BUBBLE-BUSTER"

BUT CAN I BUY IT?

Even though some NOPCO products are not now available in the desired volume, we are confident that the situation will gradually better itself. Meanwhile, we shall do our best to keep you informed of any developments. Here is a statement of the current situation on the NOPCO product advertised.

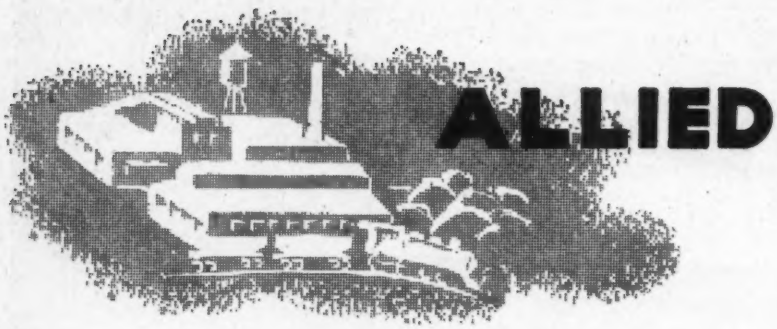
PRODUCT — NOPCO-KF

DELIVERY — Present customers' deliveries good, keeping pace with demands. Due to some tightness in raw materials, however, we are unable to accept new business at the moment, but are glad to submit samples for testing.

PRICE — Based on present costs of raw materials. Any decrease in such costs will immediately be reflected in our price.

OUTLOOK — Expect new installation to be completed in approximately 60 days. This will increase production facilities.

EVOLVED THROUGH RESEARCH NOPCO Reg. U. S. Pat. Off.



JUDGMENT OBTAINED BY COWLES & BLACK-CLAWSON IN PATENT LITIGATION

Judgment has been obtained by The Cowles Company, Cayuga, New York, and The Black-Clawson Company, in a patent infringement suit brought against San-Nap-Pak Manufacturing Company, Wheelwright, Massachusetts, for that company's violation of Cowles Patent Number 2,351,492, covering the Hydrapulper as manufactured by the Shartle & Dilts divisions of The Black-Clawson Company (Cf. P.I. & P.W., Nov., 1946).

The complaint alleged infringement on the Cowles patent by reason of use by San-Nap-Pak of an Apmew pulper purchased from American Paper Machinery & Engineering Works, Incorporated. The judgment rendered in the United States District Court for the Southern District of New York and consented to by San-Nap-Pak holds the Cowles patent valid, and infringed by use of the Apmew pulper; the San-Nap-Pak company is enjoined against further use of such machines.

The judgment also refers to a settlement under terms of which San-Nap-Pak has conveyed the infringing machine to The Cowles Company.

◆

LOCKPORT FELT CO. HOLDS ANNUAL SALES MEETING

Representatives of the sales staff and home office personnel of the Lockport Felt Company, Newfane, New York, met in a two day session recently. The field men were taken on a tour of inspection of the main works by William H. Lee, company president. New manufacturing developments being carried on by Lockport were examined by the salesmen, and the company's modernization plans were outlined for them.

In speaking to the gathering Mr. Lee stressed the importance of keeping abreast of the requirements of the paper industry; and he stated, "With the many improvements in papermaking technology, felts must be made to suit the needs, and with constant improvement of our machine operations and the broadening of our technical, research, and service departments, we are prepared to meet the test."

◆

▶▶▶ ANOTHER PROJECT IN the 1947 plans for plant expansion and rehabilitation being carried forward by the Diamond Alkali Company, Pittsburgh, has been disclosed. Administrative offices and research and development laboratory facilities will be built near Cleveland at a cost of $2,000,000. This latest project was announced January 14, and will be in addition to the $10,000,000 expansion movement Diamond has contracted at Painesville, Ohio, and Huston, Texas (Cf. P.I. & P.W., Jan., 1947).

◆

INCO TO CO-OPERATE WITH U. S. AND CANADIAN COLLEGES

Greater co-operation with universities and colleges in the United States and Canada will be stimulated by The International Nickel Company, Incorporated, New York City, through the activities of its Development and Research Division. The program will make available to engineering schools useful technical literature for instruction in chemical engineering and other courses of study.

Under the direction of Dr. W. A. Mudge, assistant director of technical service on mill products, and within the administrative scope of the development and research division, the co-operative offer made by INCO has been recognized and accepted by a number of accredited institutions.

◆

▶▶▶ EXPANSION OF Bulkley, Dunton & Company, Incorporated, has extended in the southern section of Connecticut with the establishment of a new warehouse in New Haven. William A. Rutz, who has been long associated with Bulkley, Dunton, will continue as manager. The new warehouse and enlarged sales offices will be located at 692 Campbell Avenue, West Haven.

◆

▶▶▶ FIRST POSTWAR general sales conference was held by the Peerless Pump Division of the Food Machinery Corporation at the company's Los Angeles factory. The initial meeting was presided over by F. E. Fairman, Jr., vice president of the Food Machinery organization and general manager of the Peerless Pump Division; the succeeding sessions during the week-long gathering were conducted by

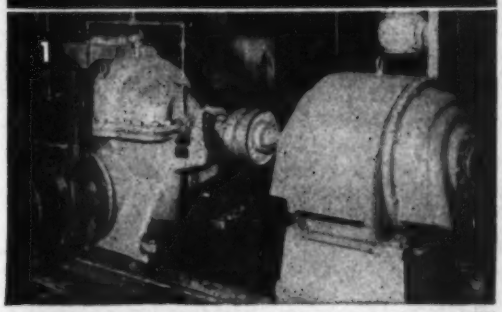
Sales representatives of the Lockport Felt Company (Newfane, N. Y.) with members of the home office staff at the company's annual fall meeting. Seated (L to R): W. W. Campbell, Jr. Mid-Atlantic States repr.; L. W. Hanke, supt.; H. J. Smith, mill manager; Wm. H. Lee, company president; B. A. Audley, asst. to the president and asst. treas.; L. D. Carner, secretary and personnel director; H. F. Brown, asst. mill manager; R. J. Lee, general mgr. and treas. Standing (L to R): T. M. Gillespie, midwestern repr.; E. J. Johnstone, sales engineer; A. B. Julin, Northern repr.; F. W. Drake, Southern repr.; C. J. Price, chief accountant; A. J. Smith, asst. superintendent; Roy T. Yates, New York City; G. W. Hardaker, South-Central repr.; H. W. Merrill, asst. accountant; A. C. Durham, West coast repr.; C. F. Wellington, purch. agent

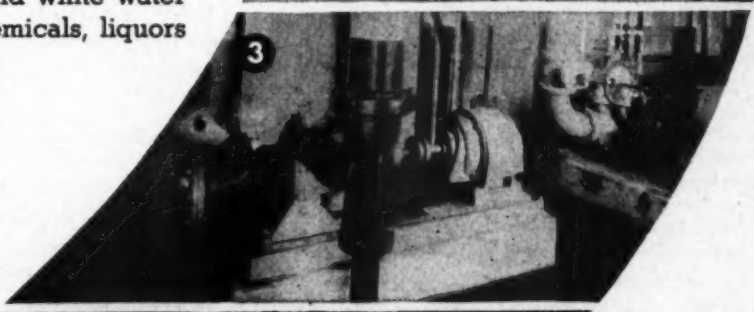
All-Purpose Pumping *means Goulds!*

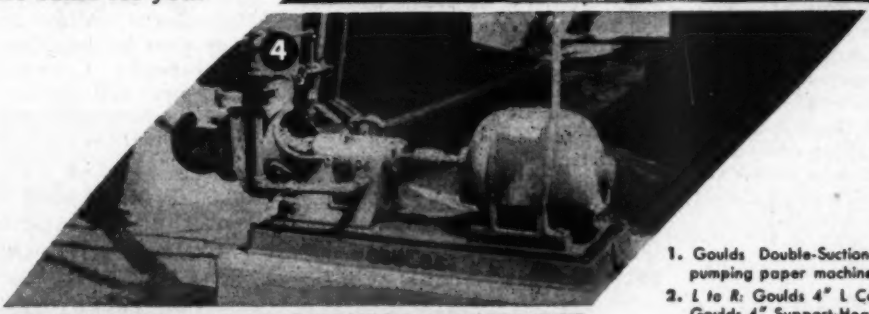
St. Marys Kraft Corp. utilizes over 30 Goulds Pumps for different purposes

JUST about every liquid transfer application encountered in a modern paper mill is handled economically by Goulds pumps. That's why so many mill operators call in Goulds engineers and say, "Tell me how many Goulds pumps I need to operate this mill efficiently!"

A case in point is the mill of St. Marys Kraft Corp., St. Marys, Ga. Here over 30 Goulds pumps are required for general water supply service, for pumping stock and white water of different consistencies, chemicals, liquors and sizes. Because Goulds makes such a complete line of paper stock pumps and pumps for general industrial service, the initial and operating costs on this installation appealed to St. Marys' buyers. Goulds can do the same for you!







1. Goulds Double-Suction Centrifugal is used for pumping paper machine white water at St. Marys.
2. *L to R:* Goulds 4" L Centrifugal Stock Pump; two Goulds 4" Support-Head black liquor centrifugals.
3. *L to R:* Goulds 4" L Centrifugal Stock Pump; Goulds 8" S, Double-Suction centrifugal for filtrate.
4. Goulds Support-Head Centrifugal for weak liquor.
5. Two Goulds 8" Double-Suction Centrifugals for fresh water.

Goulds **PUMPS, INC.**

FOR the JOB — **SENECA FALLS, N.Y.**

B. A. Tucker, division sales manager. The Peerless sales program for 1947 was discussed, and new methods in engineering, manufacturing, and production were studied by the sales representatives.

◆

WYANDOTTE CHEMICALS RES. DEPT. HOST TO MICHIGAN ALKALI DIV. SALES MGRS.

At its second annual staff meeting, the Wyandotte Chemicals Research Department was host to the district managers of the Michigan Alkali Division of Wyandotte Chemicals Corporation, Wyandotte, Michigan.

Three meetings were held which featured talks by staff members of the Research Department and by Bert Cremers, vice president in charge of Sales, Michigan Alkali Division; Mel Clark, newly appointed manager of soda ash, caustic and bicarb sales; Howard Roderick, manager of chlorine, calcium carbonate and organic sales; and W. F. Torrey, vice president of the corporation.

During the technical sessions, Research Department members gave detailed accounts of the properties of the new glycols and mixed glycols to be produced this spring and of the new Wyandotte synthetic detergent which is scheduled for production next fall. Addresses of a technical nature were given by J. J. Schaefer, director of development, and by Dr. Thomas E. Vaughn, director of research. Dr. Vaughn emphasized the theme of the meeting—co-operation between research, development and sales to better serve industrial chemical users.

◆

▶▶▶ THE GOVERNMENT ammonia plant at Lake Charles, Louisiana, has been awarded to the Mathieson Alkali Works, Incorporated, New York City. Under terms of the contract negotiated with the War Assets Administration, Mathieson will hold the plant under lease with option to purchase. The Lake Charles works is one of the ammonia producing units constructed by the government during the war; it has been in stand-by condition since 1945, and will require about four months preparation to be put into operation.

◆

MONSANTO ADDS TEXAS DIV.

Formation of a Texas Division of the Monsanto Chemical Company, St. Louis, has been announced. Headquarters for the new division will be in Texas City, where Joseph R. Mares will be general manager of the new manufacturing unit.

The 50,000 ton capacity styrene plant at Texas City which Monsanto purchased from the War Assets Administration in August 1946, will be the nucleus for the new manufacturing division (Cf. P.I. & P.W., Oct., 1946). Plant production in polystyrene plastics is expected to begin soon, and plans for greater Texas expansion are under way.

District sales managers of Wyandotte Chemicals Corporation who were guests at a recent staff meeting of the company's Research Department: Standing (L to R)—S. B. Scott, assistant to George Dunning of New York, Eastern director of sales (absent); Mel Thompson, Chicago; Martin Conway, Pittsburgh; Horace Brunner, Detroit; Roger Moister, Atlanta; and Edward Heiser, Cincinnati. Bert Cremers, vice president in charge of sales Michigan Alkali Division, is seated at the extreme left next to Dr. Thomas H. Vaughn, director of research

◆

▶▶▶ DEMAND FOR TRAINED experts in the field of instrumentation and control has lead to expansion of Bailey Meter Company's (Cleveland) staff of field engineers. A training project to give fourteen Bailey engineers a firm groundwork in combustion and automatic control engineering as applied to power plant and industrial processes is under way at the company's Cleveland factory. The course is of six months duration and when completed the Bailey engineers will be given field assignments.

◆

▶▶▶ A TRAINING COURSE directed by the Brown Instrument Company, Philadelphia (A division of the Minneapolis-Honeywell Regulator Company), has been completed by thirty-eight new sales and service engineers who have been assigned to thirty-three of the company's branch offices.

◆

▶▶▶ NINETY-FIVE EMPLOYEES of the General Electric Company, Schenectady, New York, who performed work of outstanding merit during four years of war, 1942 through 1945, received Charles A. Coffin awards for their accomplishment, on December 6. Sixty-six of the ninety-five awards are in recognition of separate accomplishment; twenty-three of the awards were given for joint work of two or more employees.

MANAGEMENT CHANGES MADE BY NICHOLS ENGINEERING

Recent managerial changes in the Nichols Engineering & Research Corporation, New York City, have given F. B. Schilling executive duties of vice president in charge of sales and general manager.

R. W. Rowen has been named vice president in charge of engineering and research.

S. Burgess has been appointed vice president in charge of field operations, and Harold E. Ingalls has been placed in charge of sales for the Nichols Freeman Vortrap and Bark Burning equipment.

◆

▶▶▶ A NEW PAPER MILL supply company, the Alcon Waste Company, has been organized by Alfred Barowsky and his brother, Mischa, of Holyoke, Massachusetts. Alfred Barowsky for many years has been connected with the Barowsky Company, Incorporated, paper mill supplies (Holyoke). The new offices will be located at 362 Dwight Street.

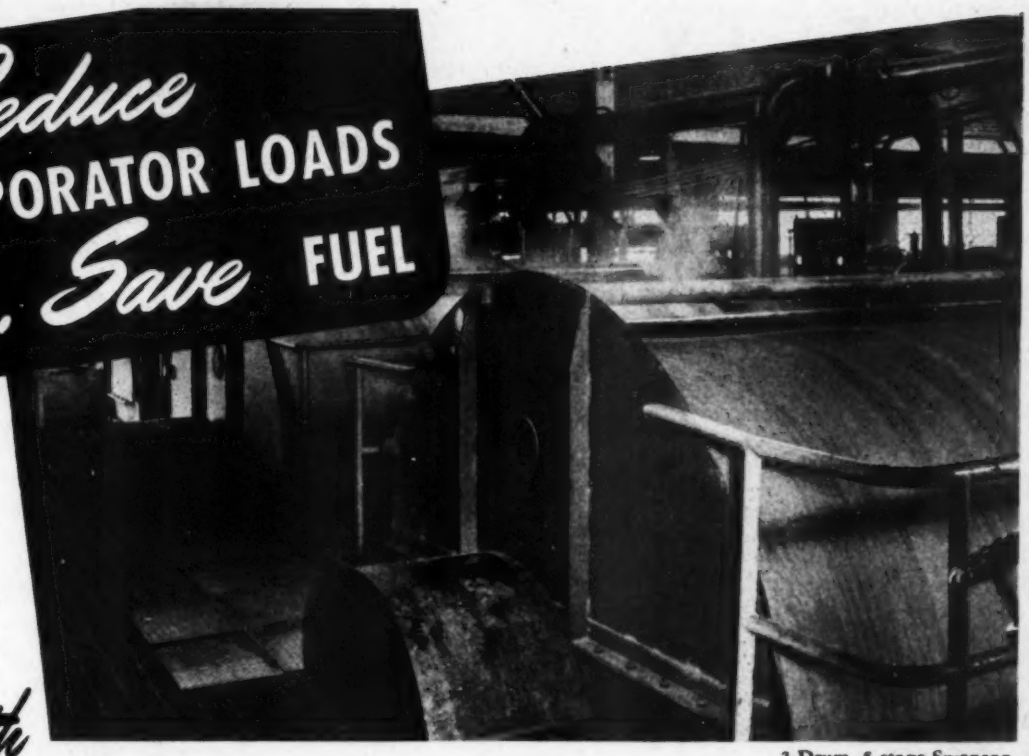
◆

PILOT PLANT ADDED TO ENLARGED COLOR LAB. OF MONSANTO PLASTICS DIV.

Construction of a new pilot plant which will further research in plastics at the Monsanto Chemical Company's Plastics Division, Springfield, Massachusetts, began late last month. The new development, estimated to cost $175,000, will be completed soon.

Company officials also announced that the color laboratory will be tripled in size to handle the increased load brought about by expanded production in all types of plastic materials. At the same time, new injection molding equipment will be installed in the color laboratory.

Reduce EVAPORATOR LOADS *. . . Save* FUEL



3-Drum, 5-stage Swenson-Nyman Pulp Washer

with

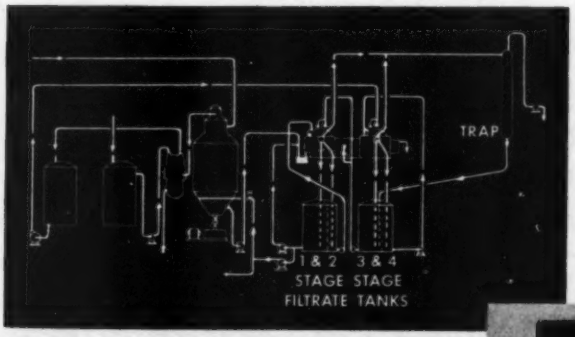
Swenson-Nyman Pulp Washers . . .

Numerous installations of Swenson-Nyman Pulp Washers have demonstrated the ability of this equipment to wash pulp clean with a low dilution factor. In a typical instance, the dilution factor is 1.8 pounds of water per pound of AD pulp; while soda losses amount to only 25 to 35 pounds per ton of pulp.

This extremely high efficiency is obtained by scientific engineering of the equipment itself—a rotary vacuum filter design that incorporates multi-stage counter-current washing in a single drum—and the equally scientific application of the equipment to the particular type of pulp being washed.

Present trends are toward an increasing number of washing stages . . . 3, 4, 5, and even 6 stages are now being employed, thus making greater use of the wash water.

The Swenson-Nyman Pulp Washer operates as a closed system, avoiding chemical loss to the sewer . . . and it minimizes foaming, the most troublesome aspect of the pulp washing operation. A full description of this equipment is given in Bulletin F-104.



Flow sheet of a 2-drum, 4-stage installation

- Black Liquor Evaporators
- Pulp Washers • Lime Sludge Filters
- Causticizers • Digester Blow Condensers
- Surface Condensers
- Kraft Pulp Deckers

SWENSON

SWENSON EVAPORATOR COMPANY

Division of Whiting Corporation
15653 Lathrop Avenue, Harvey, Ill.
Eastern Sales Office and Export Department:
30 Church St., New York 7, N. Y.

SAFETY

▶▶▶ HEADING THE Pulp and Paper Section of the Wisconsin River Valley Safety Conference to be held in June (exact meeting date will be published later), E. C. McCrory, safety engineer for the Marathon Corporation, Rothschild, Wisconsin, will be chairman. W. R. Cahill, personnel department, Nekoosa-Edwards Paper Company, Port Edwards, will act as co-chairman. Announcement of these appointments was made by F. W. Braun, vice president of Employers Mutuals, Wausau, Wisconsin, who is president of the Wisconsin Council of Safety and general chairman for the conference.

◆

▶▶▶ GERMAN-DEVELOPED safety appliances and research studies in the field of industrial accident prevention of considerable interest to American manufacturers are contained in a report of the Office of Technical Services, Department of Commerce. The 154-page documentation of German industrial safety practices was written by Edward G. Meiter and Albert J. Toering, OTS investigators, who worked for the Field Information Agency, Technical, Office of Military Government. The report is now being sold by OTS.

◆

SAFETY SCORES

▶▶▶ TWENTY-FIVE MILLS have completed the first five months of The Paper Industry Safety Contest (July to November, 1946, inclusive) with perfect scores. Frequency rates for all contestants are down eleven per cent in comparison with the rates for the same period of the 1945-1946 contest. The Paper & Board Remanufacturing Division has made the greatest reduction in rates—18 per cent. The following mills topped the five-month period without a reportable injury.

Division I—Pulp and Paper Mills

Group A

Price Bros. & Co., Ltd., Riverbend, Quebec, Can.

Group B

P. H. Glatfelter Co., Spring Grove, Pa.

Kimberly-Clark Corp. (Badger-Globe Mills), Neenah, Wis.

Price Bros & Co., Ltd. (Jonquiere Mill), Jonquiere, Quebec, Can.

Group C

Strathmore Paper Co. (West Springfield Mills), West Springfield, Mass.

Certain-teed Products Corp., E. St. Louis, Ill.

Certain-teed Products Corp., Niagara Falls, N. Y.

Certain-teed Products Corp., York, Pa.

Crown Zellerbach Corp. (Crown Williamette Paper Co. Div.), Lebanon, Ore.

Group D

Spaulding Fibre Co., Inc., Milton, N. H.

E. I. du Pont de Nemours & Co., Inc. (Russell Plant), Huntington, Mass.

Strathmore Paper Co. (Woronoco Mill No. 1), West Springfield, Mass.

International Paper Co., Livermore Falls, Maine.

Certain-teed Products Corp, Buffalo, N. Y.

Alton Box Board Co., Carlyle, Ill.

Container Corp. of America, Wilmington, Del.

International Paper Co., Riley, Maine

Division II—Paper & Board Remanufacturing

Group A—(None)

Group B

Old Colony Envelope Co., Westfield, Mass.

Kimberly-Clark Corp., Memphis, Tenn.

Fort Wayne Corrugated Paper Co. (Rochester Div.), Rochester, N. Y.

Bird & Son, Inc. (Roofing Plant), Shreveport, La.

The Flintkote Co. (Hollywood Paper Box Div.), Los Angeles, Cal.

Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.

Gaylord Container Corp., Milwaukee, Wis.

Bay West Paper Co., Green Bay, Wis.

New! a visual aid allowing group participation!

IT'S THE SAFETYGRAPH

What news! A visual aid that's ready for action all the time. No special costly equipment, nothing to do but set up the easel, turn the pages, and give the convincing, fast-moving safety talk printed on the back of each page.

What a subject! Safetygraph No. 1 is devoted entirely to "HOW TO LIFT." Every phase of lifting and handling objects is thoroughly covered.

What an idea! The 18 x 24-inch Safetygraph has 16 instructive pages of attention-getting photographs and cartoons emphasizing lifting do's and don't.

What a feature! Permits group participation in on-the-spot discusions. Workers can ask quetions, offer suggestions, and tell their accident experiences without fear of disrupting the meeting. Next time you hold a safety meeting, make it a Safetygraph Meeting!

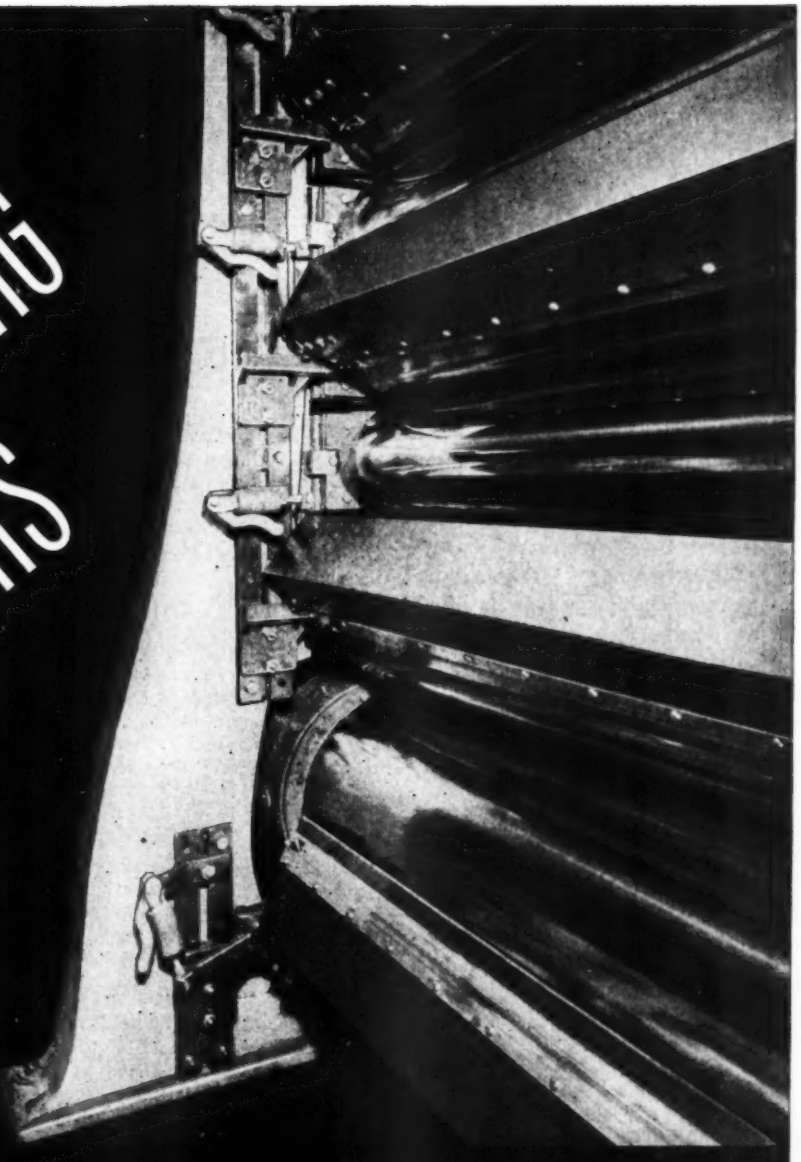
Write today! For complete details and prices address: Dept. DW-1.

Spiral Bound Pages Turn Easily—Lay Flat

NATIONAL SAFETY COUNCIL, Inc.

20 North Wacker Drive — Chicago 6, Illinois

LODDING DOCTORS



Custom designed

and *built* by Lodding Engineering Corporation, Worcester, Massachusetts.

Represented by W. E. Greene Corporation, Woolworth Building, New York.

PERSONALS

ABITIBI NAMES HENDRY GENERAL SALES MANAGER

President and general sales manager of the Abitibi Power and Paper Company, Limited, W. D. Ambridge, has announced the appointment of T. A. Hendry as general sales manager. Mr. Hendry, a native of Kingston, Ontario, began his career in the paper industry in 1919.

Formerly associated with Dill & Collins Company, of Philadelphia, Mr. Hendry joined the Mead Patton Company in 1923. This company later reorganized as the Mead Sales Company, and he held the position of vice president and general manager in that organization until 1931.

From 1931 to 1935, Mr. Hendry was vice president in charge of sales for the Fraser Companies serving both in Montreal and New York branches; he returned to the Mead Sales Company as vice president.

◆

EXECUTIVE CHANGES ARE ANNOUNCED BY RYERSON

Executive changes have been effected in the organization of Joseph T. Ryerson & Son, Incorporated, Chicago. G. Van Dyke, former head of the Special Steels Division, retired at the year's end after thirty-years service with Ryerson. Mr. Van Dyke joined the company in 1917, and his first managerial position was head of the Tool Steel Division which was expanded to include alloys and stainless steels. His work during his association with Ryerson broadened the understanding of the characteristics and properties of special analysis steel. Mr. Van Dyke wrote handbooks in this field and contributed considerable data published in leading trade journals.

Charles S. Hegel, who has been named manager of the Stainless Steel Division, joined Ryerson in 1920 spending several years in both the company's Chicago and Milwaukee plants. In 1945, Mr. Hegel became manager of the Special Steels Department of the Chicago works.

John W. Queen, who has been appointed manager of the Alloy Steel Division, is a graduate of Princeton University and joined the Ryerson sales staff in 1933 at the company's New York plant. In 1934, he became active in eastern metallurgical activities. He has served as chairman of the New Jersey Chapter of the American Society of Metals, and as chairman of the constitution and by-laws committee of the National Association of ASM.

◆

▶▶▶ Boston area representative for Farrell-Birmingham Company, Incorporated, Ansonia, Connecticut, will be *Arthur B. Pike*, who will make his headquarters at 1736 Massachusetts Avenue, Lexington, Massachusetts.

◆

▶▶▶ Appointment of *F. B. Langreck* as technical advisor and *J. M. Graham, Jr.*, and *W. Kenneth Menke* as assistant directors of Monsanto Chemical Company's (St. Louis) general development department was announced January 31.

CALCO APPOINTS WATSON AS CHIEF CHEMIST OF MARIETTA (OHIO) WORKS

Joining the Calco Chemical Division of the American Cyanamid Company (Bound Brook, New Jersey) in 1936, Dr. Glenn S. Watson was for some time connected with the Research Laboratories of the company, and prior to his recent appointment as chief chemist of the Marietta (Ohio) Works, he was assistant divisional chief chemist at the Calco home plant.

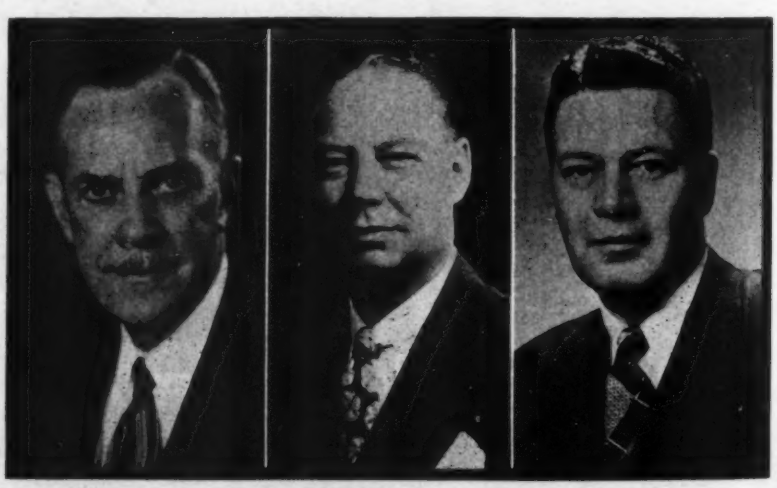
Glenn S. Watson

Announcement of his appointment to the Marietta post was made by G. A. LaVallee, manager of the Ohio development.

◆

AUSTIN PROMOTES HALLSTEIN

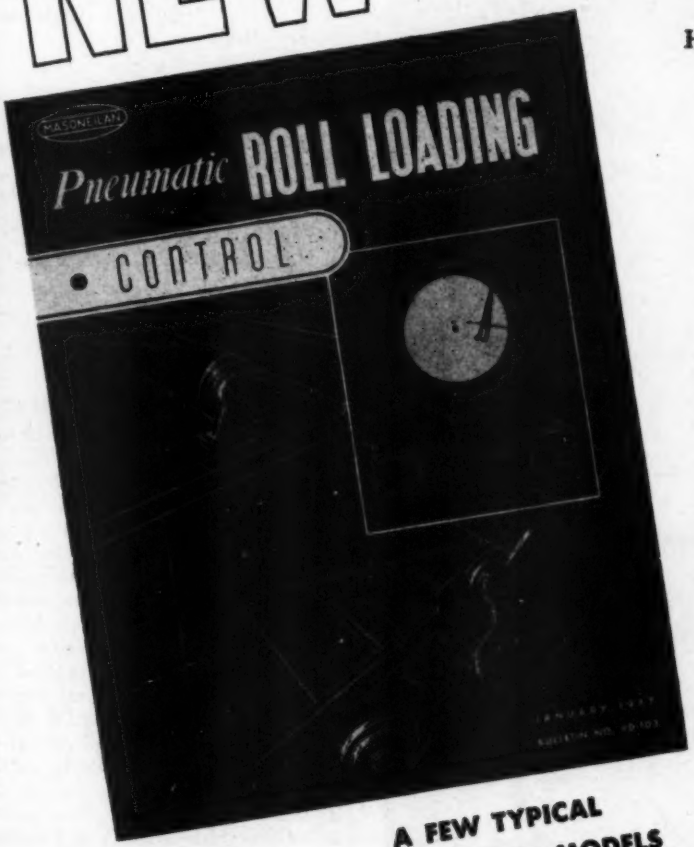
At the organization meeting of the board of directors, January 20, Harold A. Hallstein was elected to the newly created post of executive vice



Left to right: Greswold Van Dyke, Charles S. Hegel, and John W. Queen

NEW MASONEILAN CATALOG

...Pneumatic ROLL LOADING Control



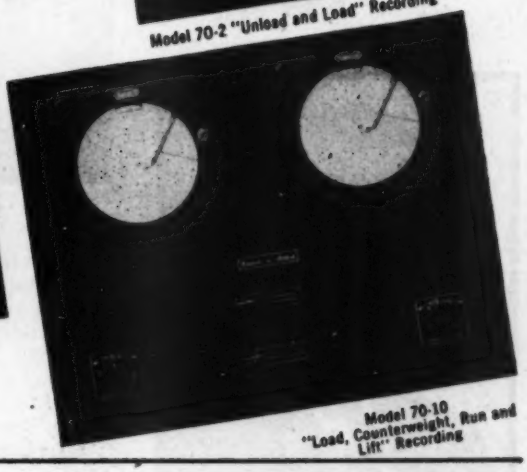
Here's a new Masoneilan catalog that every paper maker will want. It contains complete details on Exact-A-Load . . . pneumatic roll loading control; covers operation, hows application drawings, gives dimensions, and shows actual examples of figuring out the type of equipment required for specific installations . . . Write for your copy of this important catalog, today.

A FEW TYPICAL EXACT-A-LOAD MODELS

Model 70-2 "Unload and Load" Recording

Model 70-4
"Unload, Load, Run and Lift" Recording

Model 70-5
"Load and Lift" Indicating



Model 70-10
"Load, Counterweight, Run and Lift" Recording

MASONEILAN

MASON-NEILAN REGULATOR COMPANY

1196 Adams Street, Boston 24, Mass., U.S.A.

New York • Buffalo • Chicago • St. Louis • Philadelphia • Houston • Pittsburgh • Cleveland • Tulsa
Atlanta • Los Angeles • San Francisco • Mason Regulator Company of Canada, Ltd., Montreal and Toronto

president for The Austin Company, Cleveland. At a meeting of the company's stockholders, recently, board membership was increased from seven to nine; and Laurence E. Cooney, vice president and general manager of sales, together with, Harold A. Anderson, vice president and eastern district manager, were elected to the new posts.

Mr. Hallstein's record with the company began thirty-six years ago when he joined Austin as a tool boy and shipping clerk. He held a variety of clerical jobs, becoming eastern district auditor in 1917. From auditing work in the Cleveland district and as general company auditor, Mr. Hallstein advanced to vice president in 1935 and director in 1937.

Mr. Cooney joined Austin's Cleveland district staff twenty-eight years ago as assistant general construction manager. In 1944, he was named vice president and general manager of sales after having served in numerous managerial and executive positions.

Mr. Anderson, elected vice president in 1946, has been associated with Austin since 1928 when he entered the company's employ in design and estimating work. He subsequently became Chicago district estimator, project manager for the construction of the Douglas Aircraft Company's Chicago Army Aircraft Assembly Plant, and eastern district manager in 1944.

◆

▶▶▶ The new sales manager of Signode Steel Strapping Company, Chicago, *J. Milton Moon*, began his business association with the company on the field engineering staff in 1934. He was promoted to manager of the field engineering and research department in 1940.

J. Milton Moon

▶▶▶ Alteration in directorate membership and the code of regulations governing The Glidden Company (Cleveland) voted by the company stockholders has moved *Adrian D. Joyce* to the chairmanship of the board of directors. The elder Mr.

Adrian D. Joyce

Dwight P. Joyce

Joyce has been president of the organization since its founding in 1917. His son, *Dwight P. Joyce*, who has been vice president and director of the firm since 1927, has been elected president. The size of the board has been increased from eight to eleven members.

◆

SMITH PAPER CO. CHANGES

Joining the Smith Paper Company, Lee, Massachusetts, as chief chemist in 1929, and later named assistant to the company's general manager, E. A. Richardson has been given the duties of production manager. Mr. Richardson succeeds P. W. Ayers, who has retired. Assuming the post of assistant production manager is J. Ray Denton, who has been engaged in South American paper mill activities for the company during the past year.

James J. Powers, who has been a member of the Smith organization for forty years, has been appointed manager of the company's Eagle and Niagara Mills.

◆

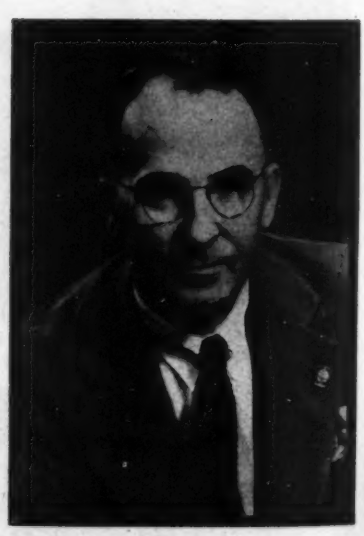
▶▶▶ Management shifts within the Brown Instrument Company, Philadelphia, have brought the appointment of *Henry M. Schmitt* as chemical industry manager, *O. B. Pyle* as industrial manager of the Philadelphia branch, and *A. W. Roat* as industrial manager of the industrial division of the Minneapolis-Honeywell Regulator Company, St. Louis.

◆

FRED HARRELL MADE VICE PRES. OF RELIANCE ELECTRIC

Formerly general works manager and director of the Reliance Electric & Engineering Company, Cleveland, Fred Harrell has been elected manufacturing vice president by the board of directors. Mr. Harrell has been with Reliance since 1934 serving in positions as assistant chief engineer in 1934, executive director of the Marine Division plant during the early years of World War II, chief engineer in 1943, and general works manager in 1945.

The board re-elected all officers of the company; and a meeting of the company stockholders preceding the directors organizational meeting named Edward E. Helm, sales vice president, to the board to succeed A. M. MacCutcheon, who retired recently.



Fred E. Harrell

FINISHING OPERATIONS SIMPLIFIED

by BROWN MOIST-O-GRAPH

Simplification of finishing operations begins at the paper making machine with a properly dried sheet.

The Brown MOIST-O-GRAPH continuously records and signals sheet moisture content. Operators now can adjust machines with certainty of results and ***consistently*** produce paper of the ***desired*** moisture content. Blackening, mottling and surface burns can be eliminated. Weight can be ***maintained*** at commercial standards.

In service on some machines as long as eight years, the Brown MOIST-O-GRAPH is the answer to long expressed demands of paper makers.

Previously restricted by our production conditions, the Brown MOIST-O-GRAPH is now available for sale anywhere in the United States or Canada. Now is the time to investigate—call in the nearest Brown engineering representative or write for full information to:

THE BROWN INSTRUMENT COMPANY, a division of Minneapolis-Honeywell Regulator Company, 4489 Wayne Avenue, Philadelphia 44, Pa. Offices in all principal cities.

TORONTO, CANADA
STOCKHOLM, SWEDEN

LONDON, ENGLAND
AMSTERDAM, HOLLAND

Brown MOIST-O-GRAPH is supplied with a large indicating scale which is easily read at a distance. The moisture is continuously recorded on a 12" chart, graduated 0-100. Signal lights on the case or elsewhere throughout the mill signal when moisture content is above or below a set point.

Brown Detector Roll is mounted directly in contact with the web of paper as it leaves the final drying roll or on top of the calender stack.

HOW IT OPERATES

The Brown MOIST-O-GRAPH operates on a long known principle that electrical conductivity is a measure of paper moisture content.

A detector roll, mounted on the last dryer roll or on the calender stack, is the only part which touches the paper. The strip chart recorder to which it is connected makes a continuous record of moisture content. Signal lights are provided to aid the operator.

Write for complete information.

BROWN MOIST-O-GRAPH

RETIREMENT AND PROMOTIONS AT CLARK TRUCTRACTOR DIV.

Following the retirement of Edwin B. Ross, vice president in charge of sales, and Ezra W. Clark, vice president and general manager of the Clark Tructractor Division, Clark Equipment Company, Battle Creek, Michigan, has announced the appointment of E. M. Schultheis as manager of sales and Leo A. Bixby as manager of engineering.

E. M. Schultheis

Mr. Schultheis was formerly Detroit sales representative for the company, and, since 1945, he has been manager of sales for the Automotive Division. Mr. Bixby has served with the Clark organization as manager of Transmissions Division and recently as manager of engineering in the Automotive Division.

L. A. Bixby

Both Mr. Ross and Mr. Clark retired in accordance with the company's plan for long service employees; however, both will remain on the company's board of directors.

◆

▶▶▶ Directors and officers of the Polymer Industries, Incorporated, Astoria, New York, now include *Dr. Frank C. Campins*, who recently jointed *Dr. M. Konigsberg* and *John W. Ogletree*. These gentlemen were formerly with the National Adhesives Division, National Starch Products, Incorporated, New York City. Polymer Industries are engaged in research and manufacturing of sizings, gums, softeners, impregnites, and laminates for the paper and textile industry.

◆

▶▶▶ Assistant vice president of The International Nickel Company of Canada, Limited, will be *H. J. French*, who has been assistant manager of the INCO Development and Research Division since 1943. Mr. French joined the INCO organization in 1929 as a member of the Research Laboratories at Bayonne, New Jersey. He is past president of the American Society of Metals, and during the war years, he served with the War Production Board.

◆

▶▶▶ Shifts among the executive personnel of the Northern Equipment Company, Erie, Pennsylvania, became effective recently. *William L. Hunter*, formerly chief engineer for the company, has been promoted to general manager of the organization. *Harold A. Schlieder* has been named to the position of chief engineer; he will be assisted by *Francis W. Bunting*.

◆

▶▶▶ President of the Interchemical Corporation, New York City, since 1937, *Ernest W. Pittman*, has been elected to the newly created office of chairman of the executive committee by the board of directors. *Herbert B. Woodman*, who became vice president and secretary of Interchemical in 1937, has been elected president of the company.

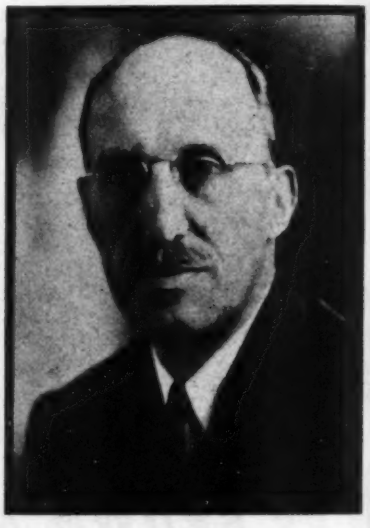
◆

▶▶▶ Appointment of *Stephen S. Conway* as vice president of the sales department of the Brake Shoe & Castings Division, American Brake Shoe Company, New York City, was announced recently. *Ralph L. Robinson*, former district sales manager of the division, has been named assistant vice president of the sales department. In Canada, *Kenneth T. Fawcett* has been appointed vice president of the Dominion Brake Shoe Company, Limited, a subsidiary of American.

J. S. KING PROMOTED TO CHICAGO BRANCH MANAGER BY FAIRBANKS, MORSE & CO.

Succeeding Frank V. Roy, who has been connected with Fairbanks, Morse since 1908, and who retires March 1, John S. King has been appointed manager of the company's Chicago branch.

Mr. King began his career with Fairbanks, Morse as a student in the Beloit plant, and in 1921 transferred to the Indianapolis works. In 1930, he became territorial representative for pumping equipment with headquarters in the Chicago branch. Assuming managership of the New Orleans branch in 1937. Mr. King continued in that capacity until 1945 when he was recalled to the Chicago executive staff.



John S. King

Since returning to Chicago, Mr. King has managed the company's pump division, and has acted as assistant manager of the railroad division. This latter post he held until his recent advancement.

◆

ROSS AND ANDERSON IN NEW MARATHON ASSIGNMENTS

Employed in 1943 as chief engineer for the Marathon Paper Mills of Canada (Marathon, Ontario), Grant D. Ross has been named mill manager for the company.

Marathon's resident engineer will be Ken Anderson, who entered the company's employ in 1944.

◆

▶▶▶ Succeeding *Arthur L. Pollard* as southern sales representative for The Reliance Electric & Engineering Company, Cleveland, *A. R. Hough* has been named as the company's agent in that area. Mr. Hough will make his headquarters in Knoxville, Tennessee.

For *ALL* your KNIFE GRINDING
The HANCHETT GK

The GK Knife Grinder will handle all your knives and shear blades with ease—turns them out with an absolutely straight and smooth edge, the first time!

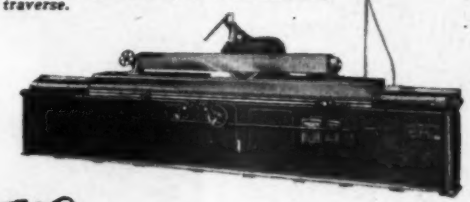
If knife grinding is a problem in your plant, consider these features. Completely automatic—no skilled operator necessary. Simple design . . . for minimum maintenance. All feed works grouped in a single unit, mounted in front . . . for easy, quick inspection. All moving parts run in a constant oil bath.

USE AN ACME KNIFE BAR FOR QUICK CHANGE-OVERS

If you have a quantity of thick and thin knives, install an Acme Knife Bar on your GK. The Acme handles both types equally well, without loss of time—just turn the knife bar over.

Operators report savings of 40% and more in knife steel, after installing GK's. Why not write the pioneers in the field today, and see how your knife maintenance costs can be cut? No obligation, of course. And ask for complete details—Bulletin 247-PW.

(Below) The GK Knife Grinder is available with Hydraulic Drive, as shown here, or with Mechanical table traverse.



★ ELECTRIC BRAZERS
★ ANVILS AND HAMMERS
★ BAND WHEEL GRINDERS
★ MISCELLANEOUS SAW & KNIFE FITTING EQUIPMENT

HANCHETT MANUFACTURING CO.
SAW AND KNIFE FITTING MACHINE DIVISION
BIG RAPIDS, MICHIGAN U.S.A.

★ SAW SHARPENERS
★ SAW STRETCHERS
★ KNIFE GRINDERS
★ SWAGES AND SHAPERS
★ WELDING CLAMPS

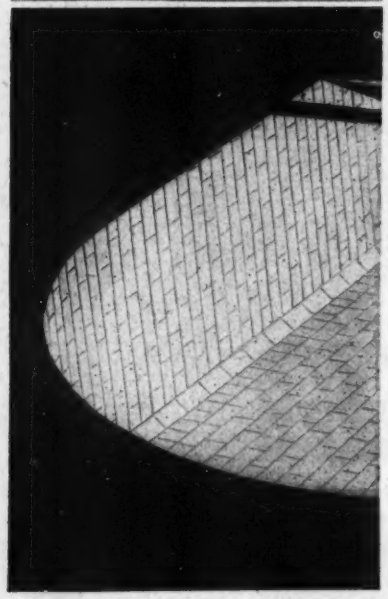
PERFECT REGISTER ...TREMENDOUS SPEED

THIS brand new No. A-4 aniline printing press offers perfect register at highest speeds on cellophanes, foils, and other materials your customers require for wrapping their products. Many other models in our complete line of presses are available for the aniline printer. Write us for complete detailed descriptions.

HUDSON-SHARP
MACHINE CO • GREEN BAY • WIS

Every time you see "Bond Paper" the chances are more than even that it was made with ASTEN DRYER FELTS
ASTEN-HILL MFG. CO. PHILADELPHIA
ASTEN-HILL LTD. VALLEYFIELD QUE.

DURISITE
Acid and
ALKALI-PROOF
CEMENT



for CORROSION-RESISTANT
MASONRY

Durisite is one of the few bonding mortars which will handle strong and weak alkalies, strong and weak acids, and all solvents. It will handle acids and alkalies alternately.

- Durisite can be stored indefinitely, without deterioration
- Durisite is non-toxic—has no dangerous effect on the skin
- Durisite is dense, non-porous—absorption less than ½ of 1%
- Durisite is quick setting—chemical hardening

Write for Free Book

Send today for Bulletin 810 — Fifty-six pages of helpful information every engineer can use. No cost. No obligation.

U. S. STONEWARE
Since 1865 • Akron, Ohio

▶▶▶ Sales manager of the steel strapping division of The Stanley Steel Works for nineteen years, *H. C. Bristoll* has been named general manager of the division. Mr. Bristoll is a member of The Industrial Packaging Engineers Association of America, and he is active as an industrial affiliate of The American Pulp and Paper Mill Superintendents Association.

H. C. Bristoll

◆

ROGER SHOALS PROMOTED BY STEIN, HALL & CO. TO MANAGE GLUE SECTION

Effective February 1, Roger Shoals became manager of the liquid glue section of the Adhesive Department of Stein, Hall & Company, New York City.

Mr. Shoals has been active in the field of adhesives for many years, joining the Stein, Hall staff in 1945 after an association with the Pneumatic Scale Corporation of Quincy, Massachusetts, and the Victor G. Bloede Company, subsidiary of Le Pages, Incorporated.

◆

E. G. PALLISTER NAMED DIVISIONAL ENGINEER FOR PROVINCIAL PAPER

Divisional engineer for Provincial Paper, Limited, Port Arthur, Ontario, will be E. G. Pallister, who will also take over part of the duties as resident engineer, a position formerly held by E. Lorne Goodall, general manager.

Mr. Pallister gained his early papermaking experience with J. R. Booth Company, Limited. Since his discharge from the Canadian Army in which he held the rank of lieutenant-colonel, Mr. Pallister has been employed by Provincial.

W. A. DELAHEY HAS BEEN NAMED AN OFFICIAL OF GREAT LAKES PAPER CO.

Former manager of the Ontario Forest Industries Association, Wallace A. Delahey has been named executive vice president of The Great Lakes Paper Company, Fort William, Ontario.

Mr. Delahey entered the service of the Ontario Lands and Forests Department in 1920, after graduating from the University of Toronto and seeing action in World War I. From 1926 to 1929, he was forest engineer with the Canadian International Paper Company, and from 1929 to 1939, Mr. Delahey was woods manager of International Paper Company's Gatineau Division. During the recent war years, he served as assistant timber controller.

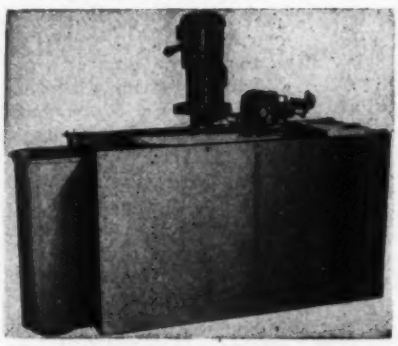
◆

▶▶▶ Rocky Mountain States representative for Joseph T. Ryerson & Son, Incorporated, Chicago, will be *Albert J. Bauer*, who succeeds *E. F. Wood* in that area. Mr. Wood has been transferred to the company's Work Order Department, Los Angeles plant, as manager.

◆

▶▶▶ Appointment of *Hubert Royer* as sales manager of the Chemical Stoneware Division of The U. S. Stoneware Company, Akron, Ohio, has been announced. Mr. Royer was formerly connected with the General Ceramics & Steatite Corporation as sales engineer, and in his twenty-seven years experience in the field, he has built an outstanding reputation in the chemical and ceramics industries. Mr. Royer will be located in the company's New York office at 60 East 42nd Street.

Hubert Royer



The DeZurik Regulator will give accurate consistency control on installations:

1. Ahead of Paper Machines.
2. From deckers and washers at consistencies up to 20% without pumping the stock.
3. After blow pits and ahead of screening systems.
4. Ahead of and between stages in bleaching systems.
5. On pressure jordaning systems where our pressure type regulator mounts directly in the stock line.
6. On any application where either the consistency or quantity or both are to be regulated.

The DeZurik Regulator offers maximum simplicity, and most accurate results. It requires less attention because there are no bearings, pivots, lever joints, etc., which require cleaning and lubrication.

We are the largest builders of "Whole Volume Consistency Regulators."

Write for the new 8-page regulator bulletin.

DeZurik Shower Company

Sartell, Minnesota

On
The Job
For Mill
Profits
Trentweld
Large Diameter
STAINLESS STEEL TUBING
Large diameter Trentweld tubing is a friend of mill men — and mill management... a strong, substantial light weight tubing in diameters up to 30 inches, for handling stock lines or acid piping on a trouble-free basis. Made of stainless steel, it is completely free of corrosion, eliminates forever all losses from contaminated water or pulp. Even more, the glass-smooth inside surface guarantees lowered friction and reduced pumping costs. It's a hard, tough tube made to outlast several ordinary pipe lines — economical service performance that's well worth thinking about. And when it's time to change, or time to install initially, you'll find Trentweld a light lift that makes the job go faster and easier.
Of course, there's a basic technical story behind this friendly tubing that you ought to hear — to judge its opportunities and advantages in handling pulp, in acid recovery, in white water lines — in short in all heating, conveying or processing problems that confront your mill. An opportunity to explain it to you will be welcome. Write Department 17 — without obligation.
TRENTWELD
STAINLESS STEEL TUBES
Sales Office - 664 N. Michigan Ave.
Chicago, 11, Ill.
TRENT TUBE MFG. CO.
Mill at
East Troy, Wisconsin

NECROLOGY

ELMER S. JOHNSON

Assistant treasurer of West Virginia Pulp and Paper Company, Elmer S. Johnson, passed away in New Rochelle, New York, January 24, at the age of forty-six. He had been associated with the West Virginia organization since 1928, when he joined the company as assistant to the treasurer.

Born in 1900, Mr. Johnson was graduated from the Columbia University School of Business in 1925 with an M.A. degree. Until his employment by the West Virginia Pulp and Paper Company, he taught accounting at the Wharton School of Finance, University of Pennsylvania.

◆

▶▶▶ *Mrs. Raymond S. Hatch,* wife of the director of the research department of Weyerhaeuser Timber Company's pulp division passed away January 21, at Longview, Washington.

JOHN A. AULL

Chairman of the board of The Sorg Paper Company, Middletown, Ohio, John A. Aull passed away February 1. He was 76 years of age.

Mr. Aull became a director of the Sorg company in 1908, at which time he moved from Pittsburgh to Middletown. Following the death of his brother-in-law, Paul A. Sorg, in 1914, Mr. Aull became president of the company. He was made chairman of the board in 1934.

The Sorg company expanded under Mr. Aull's association. In 1931, a consolidation of other Middletown companies was effected, and in 1941, the company purchased a pulp and paper mill at Port Mellon, British Columbia.

Mr. Aull was interested in many business enterprises and was a leader in civic and industrial progress of Middletown. He is survived by his widow, a son and a daughter.

◆

WILLIAM F. KELLET

Retired four years ago from the position of traffic manager of the Perkins Goodwin Company, New York City, William F. Kellet passed away at his home in Freeport, New York, at the age of sixty-six.

A native of Chicago, Mr. Kellet before his association with Perkins Goodwin had been general manager of the Tidewater Paper Storage Company of Brooklyn, and earlier in his business career, he had been president and treasurer of the Emergency Trucking and Warehousing Corporation of New York.

Mr. Kellet is survived by his widow, a son, and a sister.

◆

▶▶▶ Connected with the Nonotuck Division of the American Writing Paper Corporation for forty years, *Arthur J. Dougherty* passed away at his home in Holyoke, Massachusetts, on January 14, at the age of seventy-three. Starting with the Nonotuck Division as an office boy, Mr. Dougherty worked through many of the company's departments, becoming manager of the division. He left A.W.P. in 1934.

◆

▶▶▶ Former district manager for the Paraffine Companies, Incorporated, San Francisco, *Sidney D. Kellnar* passed away at his home in Oakland, California, January 11. Mr. Kellnar had been located in the Seattle office of the Paraffine organization prior to assuming his position in the Oakland office nine years ago. He was well known in the paper industry throughout the Northwest.

Name your Machine and Jordan Chest Requirements
EAGLE-A PAPERS
Warren Machine and Jordan Chest Pumps in operation at Riverside and Linden Divisions of American Writing Paper Corporation, Holyoke, Mass., manufacturers of famous Eagle-A Nationally Advertised Papers.

Warren Meets Every One!

SMOOTH FLOW: Unlike a plunger pump, the Warren Centrifugal gives smooth flow without pulsation.

REGULATION: Easily throttled, and unlike a plunger pump, the discharge valve may be closed without building up excessive pressure on pump and discharge line.

COMPACTNESS: Takes up less floor space and very much less head room than a plunger pump of equal capacity.

CLEAN STOCK: There are no pockets, as in a plunger pump, to hold stock from previous furnish.

ACCESSIBILITY: Diagonally split case makes it unnecessary to remove discharge piping. Rotating member easily lifted out.

MAINTENANCE: Low maintenance charges as compared with a plunger pump. Renewable liners prevent wear on suction heads. No large plunger stuffing boxes to be packed or to create friction on plungers. No plungers to be turned or replaced.

INITIAL COST: Lower than a plunger pump of much less capacity.

QUIET OPERATION: No gears making a continuous noise and creating vibration.

APPLICATION: Warren not only has the pump for this most vital service but the experience and ability to engineer its proper application.

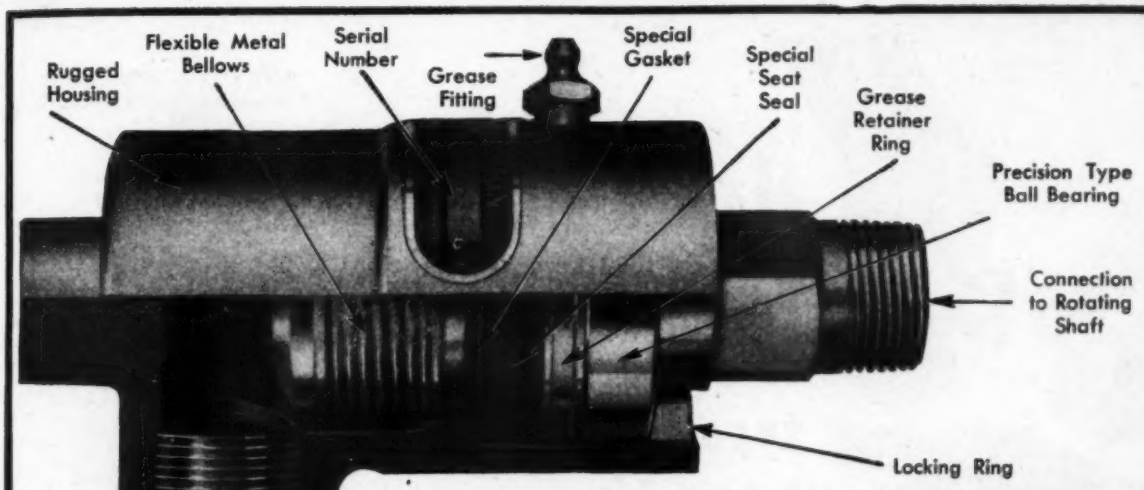
Why not try a performance tested

Warren

MACHINE CHEST PUMP

PP-51

Warren Steam Pump Company, Inc., Warren, Massachusetts



ALL PURPOSE *Ball Bearing* ROTARY UNION

There is no other unit like the ALL PURPOSE Ball Bearing ROTARY UNION. Exclusive design features, plus advanced manufacturing methods and use of special materials, make the ROTARY UNION the most efficient and most economical device for its purpose that is available on the market. Ask for your copy of Engineering Catalog No. 350.

SPEEDY DELIVERY

PERFECTING SERVICE COMPANY
6140 Cottage Grove Ave., Chicago, Ill.

Since 1828
SERVICE *to the* **INDUSTRY**

For more than one hundred years we have been serving the paper industry with specially designed machinery to meet the ever increasing demands for larger volume, low-cost production.

PAPER MAKING MACHINERY
PAPER BAG MACHINES
UNDERCUT TRIMMERS
JORDANS—FOURDRINIERS
WET AND CYLINDER MACHINES
ROTARY SPOT CUTTERS

Bulletins describing the above machines on request.

The SMITH & WINCHESTER
Manufacturing Company
SOUTH WINDHAM, CONNECTICUT

One thing we do *Well*

Specializing, too, Lindsay has made Fourdrinier wire cloth ever since 1903.

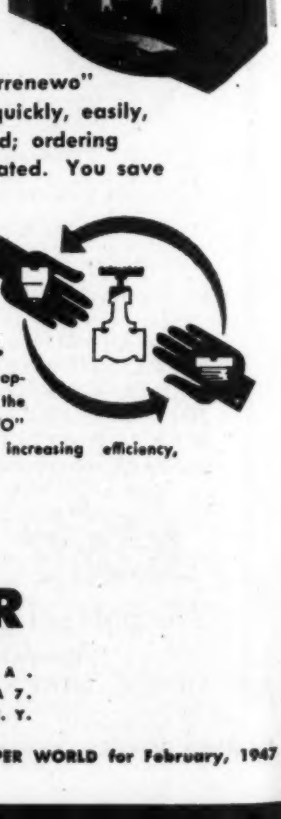
A diamond splitter sometimes studies the structure of a "rock" for many months before he "taps" it. The making of diamond dies at Lindsay is a fine art, as is the drawing of Fourdrinier wire through those dies. The selection of the diamonds themselves; the accurate laying out of the approach angle and other phases; the actual drilling of the hole by electric spark, the wire-drawing that follows,—all operations much more painstaking than one imagines. All this is specialized procedure which goes far toward giving you Fourdrinier wires exactly as you must have them.

THE LINDSAY WIRE WEAVING COMPANY
14001-14299 Aspinwall Avenue • Cleveland 10, Ohio

Lindsay **WIRES**
FOR PAPER MILLS

Here's all you need... to convert a regular type into a plug type valve...

SEATS AND DISCS INTERCHANGEABLE ★



Just insert a plug type seat and disc in place of the regular type, and you change an *entire* Bronze "Renewo" Valve from regular to plug type—providing all the extra advantages of this type, including its ability to stand up under unusually hard service. No other change is necessary. The plug type seat-and-disc combination is made to *fit perfectly* into a regular type valve of corresponding size and pattern. And you have this same interchangeability in Iron Body "Ferrenewo" Valves. You don't have to buy an entire new valve . . . you don't even have to take the valve out of the line.

*Lunkenheimer interchangeability goes still farther. *All parts* of 200 lb. "Renewo" and 150 lb. "Ferrenewo" Valves (except bodies and bonnet rings) are quickly, easily, perfectly interchangeable. Fewer parts are needed; ordering and handling are simplified; repairs are facilitated. You save time, labor, money.

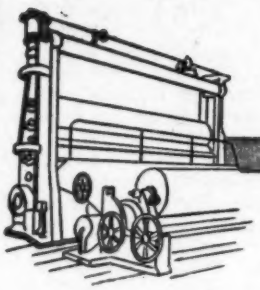
Write for a copy of Circular 567—

LET YOUR LUNKENHEIMER DISTRIBUTOR DEMONSTRATE . .

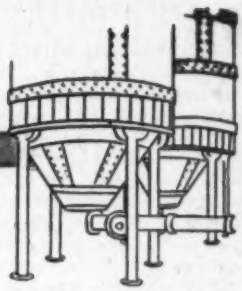
Your nearby Lunkenheimer Distributor will welcome the opportunity to show you actual samples and demonstrate the interchangeability of parts in "RENEWO" and "FERRENEWO" Valves. You'll find it a big factor in increasing efficiency, lowering costs.

THE LUNKENHEIMER COMPANY

CINCINNATI 14, OHIO, U. S. A.
NEW YORK 13, CHICAGO 6, BOSTON 10, PHILADELPHIA 7.
EXPORT DEPARTMENT: 319-322 HUDSON ST., NEW YORK 13, N. Y.



Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

Handy Chart for Determining Contents of Rectangular Tanks

The accompanying chart will be found useful for rectangular-tank volume determinations. Tank dimensions, all in inches, are given in columns A, C, and D; number of cubic feet, in column E; gallons, in column F; pounds of water, in column G; and tons of water, in column H. As a typical example, say that the width of a given tank is 10 inches; the depth, 5 inches; and the length, 20 inches. How many pounds of water will the tank hold?

To make the calculation: Find the 10 in column A. Run a straight line over to the 5 in column C. Locate the intersection with column B. Then from that point of intersection run over to the 20 in column D and note the intersection with column C. It will be observed that columns C and J are exactly alike so that perfectly horizontal lines can be drawn between them. In this instance, the intersection in column C happens to be through the 10. So, simply run a straight line through the 10 in column C and the 10 in column J as shown by the dotted line. This perfectly horizontal line gives all of the answers to the problem.

Column E shows that the tank has a volume of nearly 0.6 cu. ft.

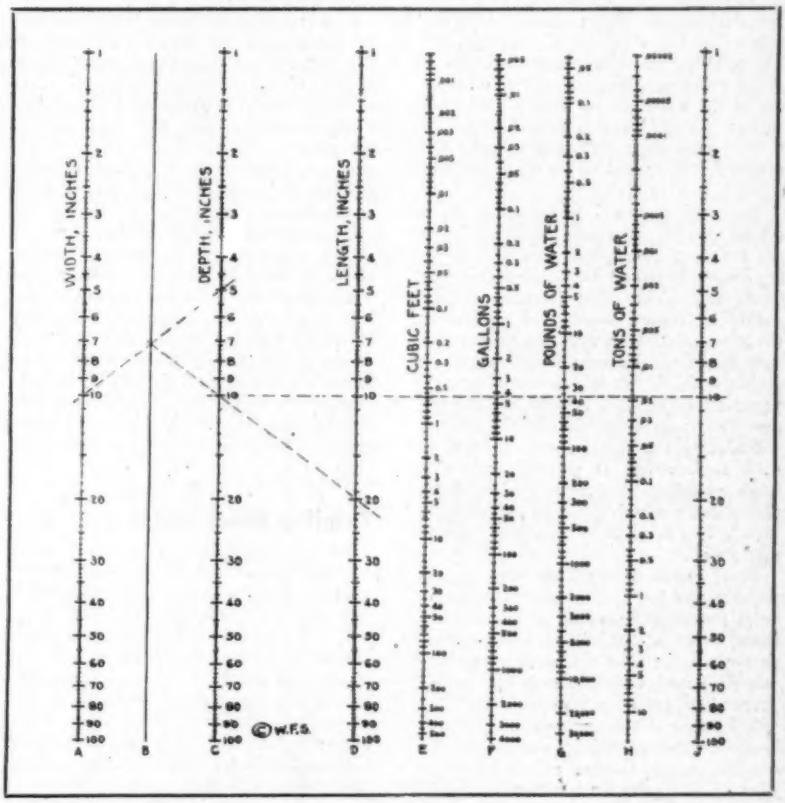
Column F shows that the number of gallons is about 4.3.

Column G shows that the tank will contain about 37 lb. of water.

Column H shows that the volume of water expressed in tons is approximately .018.

The chart has been made applicable to liquid, simply ascertain the density of the liquid. Then find the weight in pounds of water in column G, as above, and multiply that by the density of the liquid in the tank. Thus if the density of oil is .9, the tank would hold 37 lb. x .9 or 33.3 lb.

The range of the chart is great enough to take care of most tanks. In the event that dimensions are less or greater than shown, the chart can be adapted to them. For example: Say that a tank is 100 in. wide by 50 in. deep by 200 in. long. Such a tank would be exactly 1000 times the volume of the tank solved in the example above. Therefore, the same dotted line can be used throughout as shown on the chart. Merely move the decimal point three places to the right in the answers above and find that the "larger" tank has a volume of nearly 600 cu. ft.; it will hold 4,300 gal.; the weight of water will be 37,000 lb., or, a bit over 18 tons.—W. F. SCHAPHORST, M.E.



Tips on Grinding Rubber Covered Rolls

It is considered good practice to grind rubber covered press rolls at regular and frequent intervals. By adopting this procedure, only a very small amount of the rubber cover will have to be ground off each time in order to restore an even and properly crowned surface. In operation, the roll is always performing at high efficiency. Hence, when the rolls are ground infrequently, it is necessary to grind much more deeply in order to recondition them, with resultant greater waste and reduced roll life.

Rubber covered rolls are generally ground dry and if the grinding wheels are of the correct grain and grade specifications and are properly manipulated, there should be little trouble from their loading. To promote a cool cutting action and reduce loading to a minimum, the wheels should be of a fairly coarse grit size, such as 24 and 30 grit wheels. When finer grit wheels are used, they should be given a coarse dressing and then redressed periodically. The redressing can be accomplished by means of the conventional diamond dressing tool or a mechanical wheel dresser, a stiff wire brush, or by alternating the grinding of rubber covered rolls with chilled iron or brass rolls.

Wheel loading can also be controlled by using means to reduce the heat generated in grinding, such as directing a stream of air from a fan or blower so that it strikes the wheel and the work with cooling effect. Another method found effective is to adjust a suction nozzle close to the grinding contact. The face of the wheel can also be shaped so as to provide self-ventilation. This is achieved by grooving the face of the wheel so as to create a downdraft between the wheel and the work.

Taking very light cuts and operating the roll at a very slow speed is another method employed by some mills to keep the work and the wheel cool. Still others achieve the same object by reducing the wheel speed.

The speed at which rubber rolls can be ground is governed to a large extent by the density of the rubber covering. It may

be hard, medium, or soft. A hard roll, testing 0-10 reading on a Plastometer with ⅛ inch ball, can be ground faster and with a heavier cut than can a roll testing 60-70 (medium), while a roll testing 150-170 and upwards (soft) must be ground at a slower speed and lighter cuts taken.

There is no definite formula for the depth of cut and table traverse. These can best be regulated by close observation on the part of the operator, noting the way in which the wheel is cutting and so regulating the table traverse that a smooth cut is obtained. Do not attempt to use too fast a table traverse or too heavy a cut, as this will defeat the purpose of the grinding, resulting in a poor finish and damage to the grinding wheel and roll. The operator of the machine can readily note whether or not the wheel is cutting freely, or if it is generating heat and burning the rubber from the roll rather than grinding it.

As a rule, when grinding dry, the depth of cut should not exceed 0.005 inch for the roughing passes, while for the finishing passes it should be reduced to about 0.002 inch. The table traverse likewise should be slowed down. The corners of the wheel should be well rounded to prevent feed lines. Unless the roll requires a polish, it should not be touched with sandpaper after grinding, as this hand operation may cause unevenness in the surface.

Reducing the wheel speed to 5000 or 4500 surface fpm is generally advisable when grinding rubber rolls dry. Some plants use a wheel speed as low as 3000 surface fpm to insure a free and cool cutting action.

Wet grinding simplifies the cooling problem and has the advantage of providing a somewhat smoother grinding action. Clear water is best, although either soda or any of the standard soluble oil compounds mixed with water in the proper proportions are most generally used.

The same rules and precautions outlined in the preceding paragraphs for grinding rubber covered rolls may be applied to the grinding of "Stonite" rolls. —Norton Company.

◆

Hydrogen Peroxide Prevents Sore Finger Tips

The following item appeared in the February, 1946, issue of The Journal of *The Royal Institute of Public Health and Hygiene* under the title "The Prevention of Sore Finger Tips In Industry":

"According to Dr. J. B. Bates 20-volume hydrogen peroxide [5.5 per cent by weight] is very effective in protecting the tips of the fingers in workers in the paper bag industry. In one factory no less than two-thirds of the women employees suffered from sore finger tips owing to the friction of the rough paper used; and various available measures, such as the use of rubber gloves, finger stalls, and rubber solution, proved impracticable on account of the nature of the work. Purely by chance, one woman found that hydrogen peroxide was effective. She reported her discovery; and experiments showed the best way to use this chemical was in 20-volume strength, the fingers being dipped into it three times a day and dried by waving in the air. In the six months preceding this discovery, attendances at the surgery for sore fingers numbered 192 as compared with 12 in the following six months. Dr. Bates suggests that the peroxide acts by coagulating proteins in the skin."

◆

Hints on Welding a Casting Exposed to Fire

Sometimes a casting that has been exposed to fire, such as a boiler section or a grate bar will be found difficult to tin. This is because the constant exposure to heat and fire causes a change to take place in the surface of the cast iron itself. This effect can be overcome by spreading a strong oxidizing agent, such as powdered potassium chlorate, on the part of the joint just ahead of the weld puddle, while the joint is heated to a red color. As soon as the foaming ceases, the regular tinning will proceed easily and rapidly.

This oxidizing of the cast iron surface leaves a normal gray iron surface, on which it is easy to work. Although castings that have been exposed to fire can be readily repaired by bronze-welding following this treatment, it may be necessary to use the fusion welding method because of the high temperature to which the part will be subjected when it is returned to service.—The Linde Air Products Company.

◆

Painting Sheet Metal

All ordinary sheet metal exposed to the elements should be given a protective coating. Even the zinc coating of galvanized sheets is gradually weathered away, and the application of a good paint, renewed at proper intervals according to climatic conditions, will prolong the useful life of sheets almost indefinitely.

All sheets should be clean, so as to obtain close contact of paint and metal. Uncoated (black) sheets should be free from loose mill oxide and rust, and, if necessary, wire brushed and wiped with turpentine or gasoline. Grease and oil may be washed off with a suitable solvent, such as naphtha or toluol. Zinc coated (galvanized) is best prepared by simple exposure to the weather for a few months until the luster disappears. If necessary to apply paint to new zinc coated sheets, they may first be brushed with a solution of four ounces of copper sulphate, copper chloride, or copper acetate in one gallon of water, and after drying, again brushed lightly. Better results may be obtained, if facilities permit, by cleaning with a solution of 200 parts of water, 30 parts trisodium phosphate, and 4 parts of sodium hydroxide, all by weight, at 140 to 180 Fahr., then washing with hot water, followed by etching at room temperature for about one-half minute with solution of 1000 parts water, 200 parts muriatic acid, and 20 parts ammonium nitrate all by weight, and then wasning and thoroughly drying.

The weather should be clear and dry and the paint preferably applied in the afternoon, especially the priming coat, as it is essential that the surface be free from moisture. It is preferable to coat the surfaces in laps with fairly thick priming paint as the sheets are placed in position. The paint may be applied by brush or spray. The priming coat should be thin enough to fill and wet all parts as too thick a paint is liable to bridge over depressions and joints. The finish coat or coats should be thicker, and a total of not less than two coats should be applied, giving time for proper drying between coats.

Paint applied directly to sheet metal should be rust inhibitive, and the priming coat should, therefore, have a basic pigment, such as red lead, lead chromate, or zinc chromate—zinc dust and zinc oxide, three to four to one, makes efficient paint for both priming and finishing, especially as primer for zinc coated (galvanized) sheets. These primer pigments effectively neutralize acid corrosive agents, and should be protected, in acid industrial atmosphere, by acid-resisting finish coats. Iron oxide paint is used for priming and has given good service, but much better protection is obtained if it contains 10 per cent or more of basic or chromate pigment, such as zinc oxide, red lead, or zinc chromate. The pigment for the finish may be of any good moisture excluder color to match the color scheme of the structure. Linseed oil, preferably boiled, makes a good vehicle for the pigment, and excessive dryer should not be used. The use of boiled linseed oil or durable mixing varnish as part of the last coat adds to gloss and water resistance. It is economy to use only the best grades of paint for metal work.—*A Guide for Sheet Metal Workers*, Carnegie-Illinois Steel Corporation.

◆

Strainers Improve Operation Of Pumps Designed for Handling Clear Liquids

In many cases the improper functioning of pumps for clear liquids can be traced directly to the admittance of foreign material into the pump from the source of supply through the suction line. In the case of a new installation, there is also the possibility of pipe scale entering the pump and affecting the operation and life.

On general centrifugal pump installations foreign matter may clog the impeller, allowing little or no liquid to pass through resulting in scoring or seizing of rings, sleeves and other wearing parts, and necessitating major repairs.

Rotary pumps, with their metal to metal contact, are especially susceptible to damage from any solid foreign material and the utmost care should be used to make positive that the liquid reaching the pump is free of solids.

Reciprocating pumps are affected adversely, not only as a result of wear or possible breakage from foreign material, but also from the fact that such material lodges between valves and seats and allows bypassing of the liquid, thereby reducing the capacity.

It is important that where applications cover pumps for clear liquids, first, that the suction lines are cleaned and flushed thoroughly in order to remove scale or other foreign matter and secondly, that suitable strainers of proper area be em-

ployed. A strainer at the end of the suction line will largely eliminate trouble caused by solids accumulating in the source of supply. Such a strainer installation may be somewhat inconvenient to maintain on account of its being under the surface of the liquid, and the trouble involved in having to remove it for cleaning. A more convenient method is the installation of what is commonly known as a "Basket Strainer" in the suction line adjacent to the pump. Such a strainer fits into the suction line in a manner similar to a gate or check valve, and the strainer element is easily removable for cleaning.

If trouble has been encountered and a strainer is installed after initial operation, the pump should be thoroughly cleaned out before being put in service again.—*Goulds News*, Vol. 10, No. 4 (November-December, 1946).

◆

Play Safe in the Handling of Organic Solvents

Containers of organic solvents should always be carefully labeled, to avoid solvent accidents. These chemicals are generally colorless, often have a pleasant odor, and may therefore be mistaken for harmless liquids. In this way, unlabeled containers of solvents may lead to accidents as a result of ingestion or inhalation of the vapor. Moreover, the fire hazard of flammable solvents is not apparent unless clearly stated on the label.

Manufacturers of solvents, to prevent misuse of their products, use warning labels which indicate measures needed to assure safety. These labels have been developed by the Manufacturing Chemists Association and are published in its Manual L-2.

Drums or containers of solvents, if shipped directly from the manufacturer, are therefore usually correctly labeled when they arrive at the plant. Frequently, however, the drum is kept in some centrally located spot, from which cans or bottles are filled. If these smaller containers are not properly labeled, the user is left ignorant as to the nature of the liquid he is handling and injury to health or a fire may result.

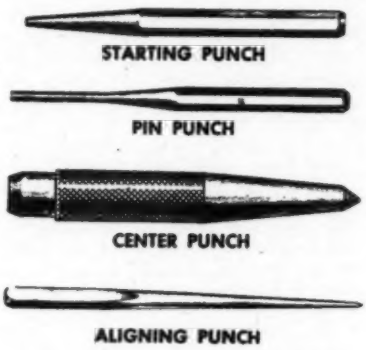
For solvent safety, it is important that every container, whatever its size, carry a label duplicating the information on the original drum. When containers are refilled, labels should be compared to prevent refilling with the wrong solvent. Supervision by responsible plant personnel at the point of distribution is advisable, to make certain that these rules are carried out.—SAFETY RESEARCH INSTITUTE.

◆

Correct Usage of Punches

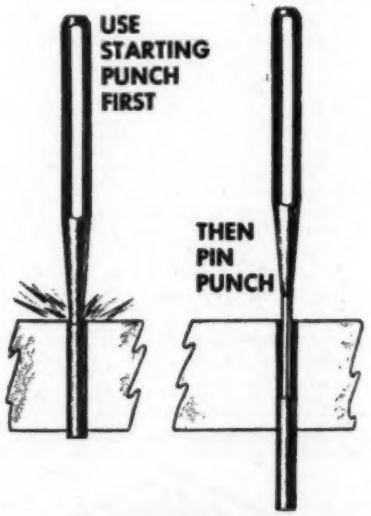
"Starting Punches," sometimes called drifts, are made with a long, gentle taper which extends from the tip to the body of the punch. They are made that way to stand heavy shock blows. This type punch is used to knock out rivets after the heads have been cut off. It also is used to start driving out straight or tapered pins because it can withstand the heavy hammer blows required to break loose the pin and start it moving.

After the pin has been driven partially out of the hole, the starting punch can no longer be used. The increasing taper on the punch becomes too large for the hole. Then the punch to use is a "pin punch." The pin punch is made with a straight shank—no taper—so that it fits into the hole. Always use the largest



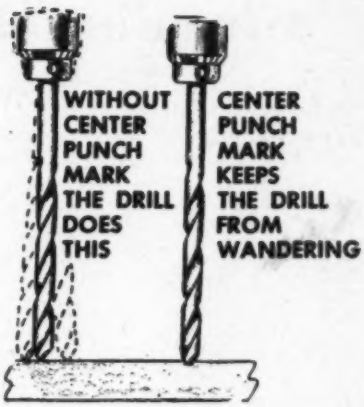
size of starting and pin punches that will fit the hole. Never use a pin punch to start a pin because, since it has a slim shank, a hard blow on the punch may cause it to bend or break. Starting punches and pin punches usually come in sets of various sizes with 3 to 5 punches in a set.

Every tool kit should contain an "aligning" or "lining-up" punch which is from 12 to 16 inches long, made from ⅜ or ¾ inch bar stock. This punch has a long taper and is useful in shifting parts so corresponding holes "line-up."



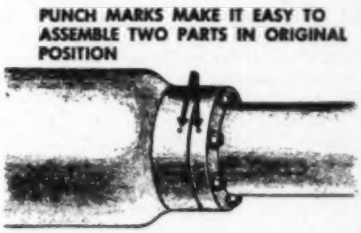
The punch is especially handy when making engine installations, replacing chassis springs, fenders and running boards, and many other jobs.

Another punch which is very valuable to the mechanic is the center punch. The center punch always is used to mark the location of a hole that is to be drilled. When the drill is placed in the center punch mark, it starts drilling the hole at that particular point. If you try to drill a hole without first locating it with a center punch mark, the drill usually will start to move all around on the piece. This is called "wandering" and when a drill starts

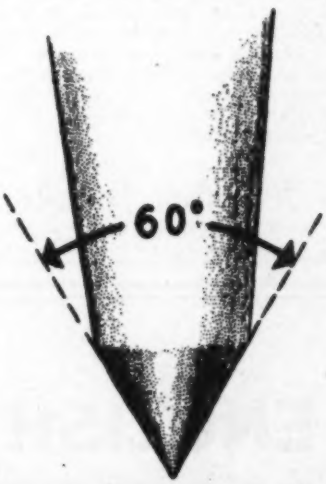


to wander, the machinc hasn't any control of the exact location of the hole.

Frequently, the cautious mechanic will use a center punch to make some corresponding punch marks on two or more parts in an assembly before he starts taking it apart. This will enable him to reassemble the parts in their original positions.



The point on a center punch is accurately ground to a true taper point which is central with the shank. The included angle is usually 60 degrees. It requires considerable experience to grind a



center punch point by hand with any degree of accuracy. For this reason, you should take good care of your center punch. Don't use a center punch on metal which is so hard that it may dull the point.—*ABC's of Hand Tools*, GENERAL MOTORS CORPORATION.

Statements Relative to Reciprocal Trade Agreements

▶▶▶ THREE STATEMENTS giving an informative outline of Reciprocal Trade Agreements were released on January 22 by the American Paper and Pulp Association. These expressions are from Cola G. Parker, president Kimberly-Clark Corporation, and first vice president of A.P.P.A.; R. E. Canfield, executive vice president Groundwood Paper Manufacturers Association; and George J. Olmstead, Jr., president S. D. Warren Company, and chairman of the Book Paper Manufacturers Association. The releases are quoted here as given out by the A.P.P.A.

COLA G. PARKER

▶▶▶ "REDUCTIONS OF duties on grades of paper listed for negotiation will have a direct and disastrous reaction on the prosperity of 163 communities 50 per cent or more dependent on their paper mills," said Cola G. Parker, president of the Kimberly-Clark Corporation of Neenah, Wisconsin, speaking for the American Paper and Pulp Association of which he is first vice president, in opposition to any reduction of duty rates on any grades of paper.

"Among these communities, which are located in twenty-five states," he continued, "are many which are 100 per cent dependent on the operation of the paper mills. Such communities include Rumford, Maine; Luke, Maryland; Cloquet, Minnesota; Canton, North Carolina; Ticonderoga, New York; West Carrollton, Ohio; Spring Grove, Pennsylvania; and Kimberly, Wisconsin.

"In addition the list of papers scheduled for negotiation will vitally affect sixty additional communities which are from 25 to 50 per cent dependent on the paper mills for their financial existence. On this latter list are such cities as Holyoke, Massachusetts; Kalamazoo, Michigan; Chillicothe, Ohio; Everett, Washington; and Rhinelander, Wisconsin.

"Paper mills must operate to a high percentage of capacity in order to meet their overhead and any reduction of duties which brings production down even slightly from normal levels results in unprofitable operation or loss of employment for the mill workers, or both. Such unemployment directly reacts on every community where a paper mill is located.

"The paper industry is an international industry, one in which every nation possesses mills of identical type, operating at substantially the same rates of speed, and there is no technological know-how in the United States which is not quickly learned if not already possessed by every other papermaking nation. The fact that foreign paper mill wages are far below our own is the factor which makes it possible for any other papermaking nation to sell paper in this country at less than our cost of production.

"Canada is thought of popularly as the country from which our imported paper comes. The fact that any duty rate concession granted Canada is immediately applicable to similar products from Scandinavian and other Northern European countries is forgotten or overlooked. It is true that when newsprint was placed on the free list, the United States newsprint industry migrated to Canada. However, the wage rates in Scandinavia are such that Sweden, Finland, and Norway can and do in normal times ship to this country every grade of paper which Canada can supply.

"Scandinavian labor costs are from one third to half of the wages paid for identical work in United States mills. In other parts of Europe the discrepancy is even greater. A typical instance is a Swedish mill making 1610 pounds per hour with a crew of four men; an American machine making the same grade of paper also operated with four men and produced 1760 pounds per hour. However, the American mill's machine crew receives $5.10 per hour as against $2.02 for the men on the Swedish machine.

"This ratio of labor cost on comparable machines extends throughout the mill, and makes it evident why the United States industry must have adequate duties to compensate for the lower wages paid abroad.

"In the eyes of the paper industry, reciprocity means the exporting of domestic prosperity and the importing of low paid foreign labor. The past history of the paper industry demonstrates that this is not theory, but a proven fact."

R. E. CANFIELD

▶▶▶ "ABOUT 100,000 TONS of Canadian paper mill capacity now making newsprint for American newspapers is being converted to the production of groundwood printing paper."

This was the statement of R. E. Canfield, executive vice president of the Groundwood Paper Manufacturers Association before the Committee for Reciprocity Information, in opposition to pending proposals which list this grade of paper for a further reduction of the present duty in the forthcoming 18-nation conference to negotiate reciprocal duty reductions.

Instead of a reduction in the present rate he urged that the present rate of one-fifth of 1 cent per pound plus 5 per cent ad valorem be restored at least to the rate of one-fourth of 1 cent per pound and 10 per cent provided by the Tariff Act of 1930.

"The mills which comprise the groundwood paper manufacturing industry," he continued, "are, with two exceptions, survivors of the holocaust let loose on the paper industry in 1913 by the removal of duty on Standard Newsprint. In that year there were seventy mills making newsprint in the United States. Today there are only 10 mills making newsprint, and thirty-two of the seventy mills existing in 1913 have ceased to exist (See Table A).

"Bankruptcies, ghost towns, depressed wages and unemployment have been milestones along the road. As a result of a 40 per cent reduction in duty by the Canadian Trade Agreement of 1938, groundwood imports from Canada alone have increased to a monthly rate 900 per cent above the starting point. In tonnage the total is now at a rate of 200,000,000 pounds per year.

"The three principal grades of groundwood papers which can be most easily made by newsprint mills are novel, a printing grade known to the trade as B-Publication, and white pencil tablet. In 1938 domestic mills made 34,567 tons of novel, but in 1945 the same mills made

ENGLISH ECCO CLAYS CLAYS
TRADE MARK
UNIFORM • SUPERIOR • DEPENDABLE
English China Clays Sales Corporation
551 Fifth Avenue, New York City

only 306 tons. The rest of United States needs came from Canada. In 1938 domestic mills made 7,171 tons of B-Publication, in 1945 produced 634 tons. In 1938 Domestic mills made 4,371 tons of white pencil tablet, in 1945 they made 72 tons.

"The United States imports more dollars worth of paper and pulp than any other commodity. We import over twice as much paper and pulp as the next highest commodity made in any substantial quantities in the United States.

"The paper and pulp industry has made its contribution to the promotion of international trade in the past and in no uncertain or minor way. To paraphrase a current slogan during the recent elections, we have had more than enough of reciprocity."

GEORGE J. OLMSTED, JR.

▶▶▶ "Even under the present rates of duty, Canada has developed a tremendous paper making industry and looms as a serious competitor for our domestic market of all uncoated printing papers."

This was the statement made by *George J. Olmsted, Jr.*, president of the S. D. Warren Company and president of the Book Paper Manufacturers Association in opposing any reduction in the rate of duty on printing paper before the Committee for Reciprocity Information.

"The Canadian pulp and paper industry has experienced an amazing development in the past seventy-five years. Between 1911 and 1921, during which period the tariff on newsprint was removed altogether, the increase in production was from $23,226,470 to $151,003,165. By 1941 the output reached $334,726,175.

"Canada for many years, therefore, has produced pulp and paper far in excess of its domestic requirements. As stated by the Canadian Pulp and Paper Association, 'admittedly the life blood of the Canadian economy is the flow of Canadian exports abroad.' Because of the American market, which prior to World War II absorbed over 80 per cent of its pulp and paper exports, the Canadian industry had developed to a point where it had an annual capacity of 4,003,000 tons of groundwood pulp, 4,101,000 tons of chemical pulp, and 4,546,000 tons of paper.

"Of late years the Canadian newsprint industry, and particularly those mills which are at a disadvantage in the production of newsprint as compared with the newer and faster speed mills, have devoted their attention to the production of groundwood printing papers. The point we wish to make is that it is a short step for the Canadian newsprint industry and particularly the lower speed mills to adapt themselves to the manufacture of book papers for export to this country. And the present tariff on uncoated book papers will not deter Canadian manufacturers from doing exactly this thing.

"The pulp and paper industry of Canada is the first industry in that country. We have made it so in large part by removing our duty on newsprint which killed the domestic newsprint industry and translated that industry to Canada.

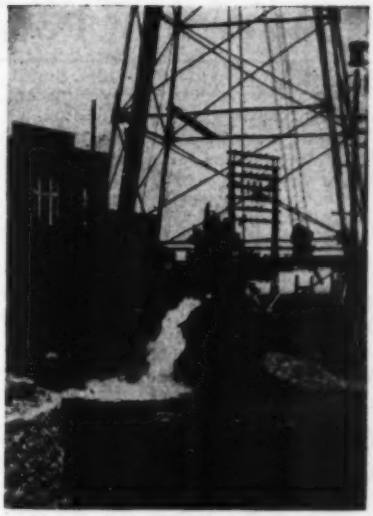
"What has been said concerning the Canadian situation applies also to Finland, Norway and Sweden. But in our minds the greatest threat, because of geographical location, comes from Canada. We are furnishing the principal market for Canada's export of pulp and paper. It has been furnished so far at the cost of our newsprint industry and a disruption for many years of all the remaining printing and fine paper domestic industries. Surely we cannot wish to go further and by lowering present duties create a strong incentive, if not the absolute necessity, of translating the groundwood and book paper industries to Canada.

"There will be a very bad shortage of newsprint in this country because newsprint manufacturers in Canada and Scandinavia will find that other grades for export to the United States will be more profitable. This shortage of newsprint will have a vital effect on the free press of this nation as well as on the price of newsprint."

TABLE A

STATE	No. of Newsprint mills in 1913	No. of such mills not now existing	No. of such mills making Newsprint only in 1946	No. of such mills making Newsprint and other grades in 1946	No. of such mills making only other grades in 1946
California	1	0	0	0	1
Connecticut	1	1	0	0	0
Maine	11	4	3	1	3
Massachusetts	1	1	0	0	0
Michigan	4	2	0	0	2
Minnesota	4	0	0	0	4
New Hampshire	1	0	0	0	1
New York	27	17	0	0	10
Ohio	1	1	0	0	0
Oregon	2	0	0	2	0
Pennsylvania	2	2	0	0	0
Vermont	2	2	0	0	0
Virginia	1	0	0	0	1
Washington	1	1	0	0	0
Wisconsin	11	1	0	0	10
Total	70	32	3	3	32

NOTE: Of five newsprint mills built in the U. S. since 1913, three now make newsprint and other grades, and two other grades exclusively.



WATER
MEANS A LOT
TO CITIES LIKE SIOUX FALLS, S. D.

Sioux Falls, S. D., is a typical American City. Like many other smaller towns, it is growing into a much more important distribution and manufacturing point. Water for further growth was needed in large—but economical quantities. The choice was a Layne Well Water System that is now producing a million gallons daily.

Sioux Falls is not burdened by high operation cost, and furthermore there will be very little—or perhaps no repair expense for years to come.

Layne Well Water Systems, used and famous the world over, are engineered for heavier duty than ever called upon to perform. Such extra ruggedness and remarkably fine quality makes them an unmatched investment for any city or industry. These Well Water Systems are built in a wide range of capacities suitable for present needs and future growth. Space requirements are small and installations can be completed in a matter of weeks.

For further information, literature, etc., address Layne & Bowler, Inc., General Offices, Memphis 8, Tenn.

HIGHEST EFFICIENCY

Layne Vertical Turbine pumps are available in sizes to produce from 40 to 16,000 gallons of water per minute. High efficiency saves hundreds of dollars on power cost per year.

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio * Layne-Pacific, Inc., Seattle, Wash. * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Western Co. of Minnesota, Minneapolis, Minn. * International Water Supply Ltd., London, Ontario, Canada * Layne-Hispano Americana, S. A., Mexico, D. F.

LAYNE

WELL WATER SYSTEMS
VERTICAL TURBINE PUMPS

Convention Papers . . . Abridged

Abridgments in this section are from papers presented at a joint meeting of the Southern and Southeastern Divisions of the ***American Pulp and Paper Mill Superintendents Association*** held in Jacksonville, Florida, November 14-16, 1946.

Over-all Economy and Steam-Electric Balance in Board Manufacture at National Container Corp.

O. WINNINGHAM
National Container Corporation

In confining this discussion to the plant of National Container at Jacksonville (Florida), it will be well to review some of the history of the plant. The buildings and grounds were not originally constructed and laid out for a paperboard mill, but were designed as, and used some twenty years as a fertilizer factory. After it was abandoned as a fertilizer factory, it was selected and taken over by National Container for a container board mill.

The space in the main building is fairly adequate for the paper machine; however, a portion of the main building on the east side was allotted to three other departments—the jordan and screen room, the power department, and the wash room. The jordan and screen room, and the wash room are built over the stock chests that are necessary to these departments, utilizing all the space on both floors. The power department occupies the space between these two departments and, of course, adjacent to the paper machine. The recovery room occupies the space on the back side of the power department. From the above, it can be readily seen that the power department is in the middle of the operation, and I might say that space is truly at a premium. All this is simply to show how close the boilers and turbines are to all departments.

The original plans of this plant called for the purchase of both steam and electricity to supplement the amount to be made only as a by-product from burning black liquor and bark. The recovery boilers and bark burner were selected with specifications to match the source from which steam was to be purchased, which was 400 lb. psi and 700 Fahr. total temperature. This determined the pattern for later installations. Early in the plans for the mill, the idea of purchasing steam was abandoned and additional steam generating equipment was installed. However, for several years after starting, 10 to 12 per cent of the electricity used was purchased from an outside source. The electric demand was finally satisfied by the installation of another turbogenerator and at present the mill is operating independently; however, the outside source is still available for emergency use.

Being crowded for space has many disadvantages which are quite obvious, but it also has some advantages. The chief advantage, I think, is that it tends to promote closer co-operation between the power department and the other departments. Usually each of the various operators in this mill know that when a change in his particular operation is made, just about what effect it will have in the power department. We had one paper machine tender who did considerable boasting that he was the best turbine operator that National Container had.

The steam generating equipment in the mill consists of the following: One oil fired steam generator rated at 100,000 lb. per hour; one bark burning boiler rated at 30,000 lb. per hour. A second bark burning boiler rated at 60,000 lb. per hour; this second bark burner is a conversion from a recovery boiler, which, however, is very well suited for this service. Both of these bark burners are also equipped with oil burners. One recovery boiler for steam production is rated at around 30,000 lb. per hour and a second recovery boiler which is rated at about 80,000 lb. per hour. All of these boilers are operating at 400 lbs. psi and 700 Fahr. total temperature.

At present, we are using only one of the recovery boilers but will be using the other shortly along with other additional equipment.

Table 1

	Per cent	Per ton Finished Board (pounds)
Oil	36	5400
Black Liquor	40	6000
Bark	18	2700
Hogged Wood	6	900
Total	100	15000

Table 2—Quantities Required per Ton of Production of Finished Board

	130 lb.	30 lb.	Total
Paper machine	...	5000	5000
Digesters	3000	...	3000
Evaporators	...	3000	3000
Caustic and Recovery	1000	...	1000
Feed Water Heating	500	600	1100
Total	4500	8600	13100

Table 3

Turbine	Throttle Flow #/Hr.	130# Ext. #/Hr.	30# Ext. #/Hr.	To Cond. #/Hr.	Kw-hr. Generated
#1	109,300	...	90,000	19,300	5290
#2	53,700	53,700	...	...	958
Feed Pump	8,000	...	8,000	...	...
Other Aux.	16,500	2,550	9,500	...	...
Totals	187,500	56,250	107,500	19,300	6248

Table 4

Turbine	Throttle Flow/Ton	130# Ext. Flow/Ton	30# Ext. Flow/Ton	To Cond. Flow/Ton	Kw-hr. Gen. per Ton
#1	8744	....	7200	1544	423
#2	4296	4296	....	....	77
Feed Pump	640	....	640	....	...
Other Aux.	1320	204	760	....	...
Total	15000	4500	8600	1544	500

Table 5

	Steam Required	Condensate Returned
To Paper Machine	5000	5000
To Evaporators	3000	3000
To Digesters	3000	....
To Caustic Room	1000	....
To Condenser	1544	1544
To Ejectors	365	....
To Boiler Blowdown	1050	....
Feed Water Heating	1100	1100
Total	16059	10644

At this point, it will be well to mention the method of, or the manner of, operations of these boilers, which possibly is not different from most other mills. The recovery and bark burners are operated according to fuel supply and convenience without regard for steam demand. The steam demand is balanced by the use of the oil fired power boiler. Table 1 is a tabulation of steam from the various sources both in percentages of total demand and also quantities per ton of finished board.

The figures given in Table 1 and those to follow are taken from our Daily Power Station Operations Report and would be representative for any normal day's operation. However, there are some days which are worse, possibly some better. This particular day is about average.

Table 2 is a tabulation of all steam demand except for generating electricity and power house auxiliaries. This tabulation also includes the demand for feed water heating.

Our present electric generating equipment consists of the following: One 5000 kw. double automatic extraction condensing turbogenerator equipped with a 2400 square foot surface condenser. The electric generator is rated at 6250 kv.-a. at .8Pf. One 1500 kw. turbogenerator which generator is rated at 1500 kv.-a. at .8Pf. These two turbines are arranged for parallel operation serving the distribution switchboard which is located in the turbine room. This switchboard is also arranged for tie-in with outside power source.

Table 3 is a tabulation of the steam flow rates of both turbines and other power house auxiliaries:

Using the hourly flow tabulations (Table 3) as a basis for flow per ton and using hourly production for this day which was 12.5 tons, we are able to make the tabulation of consumption of steam and electricity per ton of finished board (Table 4).

Earlier in these remarks, it was pointed out that the initial pressure for this power plant was determined by the source from which it was expected to purchase steam, which is 400# psi 700 Fahr. Inasmuch as we are using 1544# of steam per ton of production to the condenser to force a steam-electric balance, it would be possible to raise the over-all efficiency of the power plant considerably by raising the initial pressure thereby making it possible to get more electric energy from the extracted steam. This is not possible as our boilers are operating at their maximum design pressure.

One other factor that has considerable bearing on the over-all economy of the power situation is the amount of feed water makeup. Feed water makeup is of necessity high in any paper and pulp mill for the simple reason that much of the steam used goes directly into the process and is not returnable to the boiler feed water system. Here at National Container we have two good reasons for watching the makeup closely; one as a matter of economy and the other that our existing facilities for treatment of makeup feed water are not adequate for additional demand. At present we are cooking by injecting the steam directly into the digesters which means that all the steam going to the digesters is a total loss so far as boiler feed water is concerned. Also heating in the caustic room is direct and, of course, none of this is returned.

Table 5 accounts for condensate from all places where steam is used.

From Table 5 we find the gross requirements for feed water to be 5415 of treated makeup per ton of finished board. Expressing this in a way that is more easily remembered, that is, as percentage of makeup gross requirements per ton, it is 36 per cent. The big loss in the feed water makeup is in the heat required to bring the feed water up to temperature.

It is very important that all departments function properly at the same time. If for any reason steam demand is reduced in any department and the electric load is not reduced with it (and it is rarely ever the case that the electric load and steam demand run exactly parallel), the steam flow to the condenser will have to change to maintain the balance. Until recently, we were troubled considerably with improper drainage on the dryers. For this reason many times the paper machine had to be slowed back which reduced the rate of production, also reducing the demand for 30# steam. All the electrical equipment continued to operate normally consuming the same amount of electric power. The above operation always threw more load to the condenser, thereby lower-

More Uniformly Defibered and Hydrated Stock

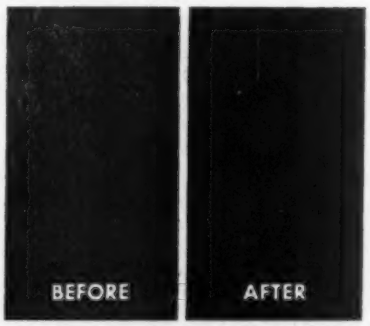
The use of Magnus Beatex in the beater consistently provides for better formation. Not only are defibering and hydration speeded and improved, but a freer stock is obtained with better interlacing of fibers which leads to material improvement in retention of short fibers and fillers.

Magnus Beatex is a neutral synthetic wetting agent which forms no free alkali in solution, and does not affect the pH of the stock in any way. It is completely compatible with all materials used in furnish or sizing.

Beatex is an excellent dispersing agent and is particularly useful on stock containing a high amount of wax, ink and other foreign matter which tends to cause spotting and discoloration. This effective dispersing action of Beatex has made it possible in many mills to use a larger amount of low-cost furnish. Where improved absorbency is desirable, Beatex has proved to be most valuable.

In general, Beatex is used on kraft and sulphite pulp, and on stuffs with relatively high percentages of scrap. It is thus in wide use in board and roofing paper mills. It is also used extensively to improve formation and softness on fruit wrap stocks.

Cleaning Felts On the Machine



Any of the specialized Magnus Felt Reconditioners can be used to clean felts on the machine, either by saturating the felt with sprayed solution from the stock tank or by slacking off the rolls, roping up the felts and throwing on the solution from buckets. All these materials are free-rinsing, and are thoroughly and speedily rinsed by water from the showers.

Magnus Felt Cleaner is a mildly alkaline soap chiefly used for heavily loaded felts. Magnus Feltex is a soapless cleaner with exceptional wetting properties used on all types of felts and particularly on badly limed felts. Magnus NX is similar to Feltex, but is non-alkaline and neutral. It is especially valuable for breaking in new felts. Magnus Saponex B is a slightly alkaline wetting agent type of synthetic soap used for any felt conditioning operations where high rinsibility is advantageous.

Removing Pitch Spots from the Wire

Using Magnus Pitchex, an emulsifiable solvent soap cleaner, it is readily possible to clean pitch spots from fourdrinier wire while in motion.

Use a brush or broom dipped in Pitchex to reach all pitch spots on the wire as it passes the head of the machine. In this way the cleaner is given the maximum time to dissolve the deposits before the wire reaches the showers, where the cleaner and the dispersed pitch are flushed away.

Improved Grinding of Calender Rolls

This grinding operation can be materially improved by using a 2 ounce per gallon solution of Magnus #1 as the grinding solution. This alkaline cleaner not only imparts an anti-rust effect to the solution, but considerably improves its cooling properties. It speeds up the grinding operation by cleaning away deposits of soluble oils and metal particles before they accumulate on the grinding wheels. Grinding action is smoother and chatter marks are eliminated. (Advertisement)

Magnus Chemical Co.
Paper Mill Cleaners
Garwood, N. J.
In Canada—Magnus Chemicals, Ltd.
4040 Rue Masson, Montreal 36, Que.

ing the over-all economy. We have improved this situation immensely in the last few months by rebuilding the drainage system on the paper machine so that at present we have a minimum of slowbacks because of water-logged dryers. In fact, we have increased drying capacity which, in turn, raised our production rate. This was immediately reflected in a better steam-electric balance.

At National Container, the following figures are made conspicuous on the Daily Report: Barrels of Oil Consumed for Power per Ton of Production; Gross Steam Requirements of Steam per Ton of Production; kw.-hr. per Ton of Production, Feed Water Makeup Expressed in Per Cent of Gross Steam Requirements. If the consumption of oil is in line, then all the others will have to be right, for any losses from any cause whatever in the whole power department immediately reflects back in the oil consumption. If the amount of steam coming from the recovery is down for any reason, it immediately shows up in the amount of oil used per ton of production.

Fundamental Principles of Machine Head Box and Slice in Relation to Formation on the Wire

SAMUEL M. BRATTON
The Pusey & Jones Corporation

It is not the purpose of this paper to determine or even suggest what is the most perfect stock approach, but to discuss different types in use today and some that are being designed for some of the machines that will be installed in the near future, as well as ideas that have been and are talked about extensively.

Let us consider the type of head box and slice of years ago. The difference between the inside of head box and opening and the distances between deckles form corners for the stock to settle, resulting in flocculation and causing currents to flow toward the center line of the machine.

The deckles set at maximum distance would give a different effect than when set at minimum distance.

One of the first improvements was to make the head boxes the same width as the forming surface. Although this made a great improvement, there were still streaks in the formation. These streaks were caused by currents caused by the method of delivery to the head box.

Delivery was usually made from screens to the first compartment, sometimes called a knapsack.

Where only one screen was used, the action of the currents was directly down the center of the machine. With two screens, there was a converging of currents and with three screens, more converging points. The use of four or more screens will make the overall of the screen openings more than the width of the head box, thereby requiring the stock to run toward the center of the machine, the currents converging as they choose, with the usual result of undesirable currents.

There are machines being built today with as many as five screens discharging into a common trough or screen hopper, designed so the stock will flow at the same speed from the ends to a common discharge in the bottom at the centerline of the machine, then to a distributing header similar to the screen trough but entirely enclosed and turned upside down, carefully designed for steady flow of the stock.

Between the screen trough and distributing header is a flat side valve opening from the center in both directions. The purpose of this valve is to maintain a level in the screen hopper so there will be no cascading from the screens and entraining air regardless of the head of stock in the head box.

Leading from the distributing header to the head box as many discharge pipes as can be conveniently arranged to deliver the stock as evenly as possible across the machine.

Instead of the usual steel pipes and gate valves, the discharges are rubber hoses that have a device for pinching the flow if any regulation be desired. With this method there are no abrupt restrictions such as are encountered with the standard gate valve. At the end of these hoses are flaring adaptors connected to the head box to further spread the stock as much as possible.

Often when screens are not required, the stock is pumped direct to the head box by way of a pipe direct to a header entering midway between ends, then discharging through several pipes with gate valve control, others without valves.

Another method of connection from the fan pump to the head box is to divide the discharge to each end of a manifold, then to the headbox as above, or to two rectangular tapered sections with slot discharges the full machine width.

The flow spreader, fully described at the TAPPI Meeting in Boston, September 30, 1942, and published in Paper Mill News December 2 of the same year, receives the stock from the fan pump through a circular section converging into a rectangular section and widening to the full width of the machine. As the flow is widened, the area is reduced, resulting in the entrance to the flow box or slice back in the form of a slot.

The flow spreader, being longer than can usually be installed without bending, is folded, necessitating several bends at 180 degrees. By laboratory tests, shapes have been developed to reduce turbulence to a minimum.

With the Bertram flow spreader, the flow enters a single passage, divides into two, then four, eight, sixteen, thirty-two, sixty-four, and so on, all passages of the same length. Not having seen one of these in operation, I am not prepared to comment.

There is still another method that has been used and may be given more consideration in the future; that is, the stock is pumped into what is called an upflow head box. The discharge pipe enters the bottom, which is built like a cone within a cone, the stock rising through the center, and due to the enlarging area the kinetic energy and air are released. Then the stock flows down between the inner and outer cones to whatever type of distribution to the head box may be selected. There may be more advantages to this arrangement than we know of now, as very little research has been done to determine its value.

Head boxes must be given careful study. As the consistency of stock to make the many different grades of papers and boards varies over such a wide range, it cannot be expected to design one head box to suit all conditions.

The rate of flow through the several passes must be carefully proportioned according to the gallons per minute per inch of width of the head box so as to move the stock fast enough to prevent flocking and at the same time keep turbulence down to a minimum. There should be some turbulence to keep the stock well mixed and at the same time not to form uncontrolled currents.

Usually the lower the consistency the more passes required to reduce the speed of the stock, whereas the higher consistencies can be controlled with less passes. There is also a type of head box that is closed in entirely and used with a pressure slice. This will be further explained under slices. When building head boxes, arrangements should be made for installing perforated rolls in every pass so they can be installed at a later date if desired.

Perforated rolls should be used wherever possible instead of boards or plates. They, being revolved, will prevent the hanging up of fibers that later become lumps, which break away and cause a breadown of the sheet on the machine.

Unless the box is built for high minimum speed, the baffles coming up from the bottom of the box should not extend any higher than the apron board so as to prevent cascading when operating at slow speeds. The baffles from the top under which the stock flows may be built in solid or have adjustment if desired by the purchaser, although it is the opinion that the adjustment of these baffles has been much abused to satisfy some theory the operator may have. However, if these baffles can be built in solid, a great source of lump forming can be eliminated, which will more than offset any advantage that may be gained by adjusting the baffles.

Usually just before the stock reaches the slice, there is a small perforated roll. Sometimes a baffle or perforated board is located directly over, the intention being to compel the stock to go through instead of a portion passing over the roll, and with the perforated board to act the same as the roll in finally breaking up currents just ahead of the slice, the stock is higher than the perforated roll.

The head boxes are provided with the usual quick-dumping valves, manholes handhole to facilitate cleaning and repairing.

Showers should be installed over each pass, having both revolving and reciprocating motion to keep foam reduced to a minimum.

The inside of the box should be as smooth as possible, free from crevices and projections that may cause fibers to

hang up and form lumps, and prevent accumulation of slime. The surfaces next to the stock should be of non-corrosive material or properly protected with suitable coatings. Thin sheet linings fastened or welded to the main sections should be avoided as this has not proven satisfactory.

We now come to the slice. Although the slice has a lot of control over the flow of stock to the wire, it cannot be expected to accept any kind of flow from the head box and make a perfect delivery.

The shape of the slice lip and its relation to the lower apron has great effect on the flow. The speed, temperature, and consistency affect the flow, and any change in either of these will change the delivery to the wire and have its effect on formation.

For high speed machines, the single slice is used, and for some of the machines making heavy weights and high quality, two slices are used.

The single slices are of three major types: The straight back slice with small angle at the bottom with a series of adjustments to level the sheet; the straight lip on an angle that can be changed slightly and the individual adjustments to level the sheet; and the curved lip with the same adjustments.

In times past, the straight slice has been considered the slow speed slice, and the angle or curved lip slices the high speed slices. As stated above, the relation of the slice lip and apron lip affects delivery on the wire so much that provisions are made to adjust their positions with each other. This feature is being incorporated in most slices and there is a possibility that the straight slice can be used for high speed with good results.

It is also known that the relation of the apron and breast roll affects the lay of the stock on the wire, and to take care of this, provisions are being made for horizontal adjustment of the breast roll. Some are arranged so the adjustment can be made while the machine is running.

Another type of slice that is receiving considerable attention is the pressure or hydraulic slice. Some of these slices are in use and appear to be the logical type for paper speeds of 1600 feet per minute and over. At these speeds, the usual open pond to give the necessary hydraulic head will be so high and heavy as to tax construction limits, therefore, if the speeds that are being commonly talked of are to be reached, then the pressure or hydraulic slice seems to be inevitable.

Pressure or hydraulic slices now in use and proposed will receive the stock directly from the pump through a flow spreader or distributor of one type or another similar to that back of the head box referred to hereinbefore. Adjustments are provided so the slice lip can have the same adjustment as any other slice and provisions made for easy access for cleaning and other purposes.

Careful design is necessary to avoid air traps and prevent leakage. Some pressure slices now in use have a perforated roll close to the slice, which, of course, makes a space for air accumulation and must be relieved by vents or it will spout out on the wire with the usual result.

Designs are being prepared to locate the perforated rolls, if required, below the top of the breast roll, then the highest point of the stock will be at the opening to the wire, thus dispensing the entrained air while in small particles and harmless.

Another feature of the pressure or hydraulic slice is that the top lip can be extended as far beyond the breast roll as desired, giving pressure formation. This also can be done with the other slices with the open pond head if sufficient adjustment is included in the construction.

Human Relations in Industry

RAYMOND F. BENNETT, Gen. Supt.
Ecusta Paper Corporation

The ideal employer-employee relationship exists where there is one employer and one employee with each one treating the other as he would like to be treated under the same circumstances. The employer pays as much in wages and other advantages as his business will afford and he is confident that the employee is working for his best interests at all times. Consequently, he can concentrate on keeping the business going with mutual benefit to both his employee and himself. The employee feels secure in his job, and knows that his employer will pay him as much as the business will stand, which, in the normal course of events, is at least as much as is paid in the industry and locality for a like amount of service rendered. Consequently, he can concentrate on his job without worrying about security or financial troubles or the real or imaginary troubles of other employees. He can also concentrate on using all of his normal working time and best efforts, for the benefit of the business. He knows the ups and downs of the business and has a vital interest in it. If he has troubles that he thinks his employer can help him out with, he goes to him for help and advice and gets it. These two are good friends who realize that they have their prosperity and economic security in common, and must work closely together for the benefit of each.

As the employer's business grows and he takes on more employees to the extent that he loses contact with them, this good relationship has a tendency to deteriorate. As the number of employees increases there will be a larger chance for chronically dissatisfied misfits and trouble makers to get on the payroll to strain the good relationship. Sooner or later, professional union organizers will be around talking to the employees in an effort to convince them that their employer is not looking after their best interests. This is quite a strain on the good relationship.

The Wagner Labor Act was obviously passed to allow employees to organize if they cared to, and the NLRB was created to administer it. What actually can happen is that a small percentage of a company's employees can join a union and shut the mill down against the wishes of the majority. If the employer says what he thinks about the union that precipitated the trouble, he may be found guilty by the NLRB of influencing the opinions of his employees, and, consequently, unfair labor practices. If the strikers or their sympathizers damage property or injure people during the strike, frequently, nothing is done about it.

In New York, New Jersey, and Massachusetts, laws have been passed for the obvious purpose of preventing oppression of any class of people by discrimination in employment. What actually is now in effect in New York is that it is unlawful for an employer to ask a prospective employee about his race, creed, color, or national origin. He may not

This is an **OWEN PULPWOOD GRAPPLE**

To handle a *greater volume* of pulpwood in *less time* and at a *reduced cost,* some of the world's largest Pulp and Paper Mills have installed the Owen Grapple System.

Wouldn't it be wise to think in terms of your pulpwood handling problems today, in order that you may operate the more profitable "Owen Way" tomorrow?

Write for illustrated bulletin.

The **OWEN BUCKET** *Co.* BRANCHES: New York, Philadelphia, Chicago, Berkeley, Calif.
6015 BREAKWATER AVE., CLEVELAND, OHIO

even ask for a picture that might indicate the color or national origin of the prospect. Since two states have followed New York's lead, other states will probably do the same, and if a majority of them do, they will possibly be followed by the Federal Government. This will surely not help industrial relations.

Employees are just as important as customers and in most cases, require more attention because of their larger numbers. The employer should remember the example of the employer with one employee and follow it as closely as possible. He should become interested in his employees and show it by the wages paid both in money and other considerations. He should divide them into groups of a size that will allow one supervisor to have sufficient personal contact with each employee. He should then choose supervisors that will do their job as he wants it done and back them up. These supervisors are the salesmen he is sending out to his prospective employee customers. Since he probably won't find them ready-made, he will have to mold them. When finished, a department head should fill the following specifications.

He should realize that the proper supervision of people is most complicated because each person is different from the other in a variable number of ways and is subject to change. Consequently, if he is to do a good job, he must devote his time, energy, thought, and study to the people under his supervision. He should realize that quality products, maximum efficiency, and continuous operation come only from well-paid workers who are enthusiastically interested in their work, are proud of their jobs, are satisfied with their working conditions, and have faith in the integrity of their company's management.

He should feel his responsibility for doing everything possible to create this state of mind.

He should use his influence in eliminating and preventing pay inequities. When a raise is allowable and justified, he should recommend it without delay.

He should also take an active civic interest in the community so as to help make living conditions for his workers as agreeable and economical as possible.

He should realize that regardless of humanitarian attitude of top management or the size and scope of personnel departments, or the amount of money spent on recreation programs, a worker's boss is management as far as he is concerned.

Since the worker's opinion of his employer is governed by his opinion of his boss, it is this boss's responsibility to see that this opinion is the proper one. To do this, he must live the part well and constantly, because workers are very observing, critical, and long-remembering.

He should be interested in the comfort, convenience, and welfare of his workers and should use his influence with his employer in their behalf. He should find out what they want in the way of a company sponsored recreation and welfare program and do all possible to get it for them and make it successful. Nothing should be shoved down their necks. Workers have a friendly feeling for an employer that is interested in giving them the things they want, but resent any attempts to regulate their whole lives.

He should be fair and honest and see that every person under his supervision gets a square deal in all his relations with the company.

He should strive to keep the equipment and methods in use in his department as modern as possible. This makes it easier for the workers to produce top quality products.

He should be accessible to his workers at all times and should cause them to feel at ease when talking to him. He should thank them for any complaints or suggestions, even if ridiculous, and never argue. Each complaint or suggestion should be personally investigated as soon as possible. If action is indicated, it should be taken, and if not, a logical and satisfactory reason should be given. If official credit is due for a suggestion, it should be given quickly and freely.

He should see that his workers are subject to only just and enforceable rules that are for the good of all concerned. He should then see that these are followed impartially.

He should use discretion in choosing or keeping employees who are incurable misfits, as they contribute nothing but a demoralizing influence on the organization.

He should never reprimand a worker in the heat of anger nor humiliate him in front of others. If a reprimand is given justly, deliberately, and in private, it will pay dividends in self-respect and in respect from his employees.

He should never show unearned favoritism and his relatives should best work under soneone else's supervision. Social connections, politics, religion, and such private affairs should be left outside the mill. All employees should be taught by experience that they will be treated only in accordance with the effort they put forth on the job and not in accordance with whom they have outside connections. They should be taught that their jobs will be secure for as long a time as they take care of them. No worker will do his best if he thinks he will not be treated justly or that his job is insecure through no fault of his own.

The supervisor should be consistent in his ideas so that it will be easier for his employees to give him the results he wants. Workers normally want to give satisfaction and it should be made as easy as possible for them to do so.

He should be considerate, patient, and pleasant and not indulge in childish moods of temperament. He should remember that his employees are much more sensitive to his actions and remarks than he is to theirs.

He should be generous of his praise when it is deserved and cause each of his employees to have a feeling of personal importance in contrast to feeling like an unimportant cog in a big gear.

He should endeavor to keep his employees sold on the fact that their interests and those of the management are the same and that their individual and collective efforts toward efficient operation affect the company's profits and, consequently, wages.

He should remember that he represents not only his employer to his employees but his employees to his employer.

Since his employer depends on him to keep him fully informed as to the desires, opinions, and reactions of his employees, he must do this intelligently, faithfully, and honestly, if the best interests of all are to be served.

We, as superintendents, are presenting the employer to the employees and are in the most strategic positions to influence relations in our mills. Consequently, the maintenance of best relations possible is our moral obligation. If we do a good job of this, we well have made a substantial contribution, to not only the preservation and prosperity of our industry, but to the free enterprise system which is the foundation on which our country was built and still stands.

Rubber Rolls in the Paper Industry

HARRY HULMES
United States Rubber Company

In November, of 1942, the rubber industry was called over night to substitute synthetic for natural rubber, this despite the fact that the synthetic rubber was supposed to be deficient in the very properties required for best roll construction. This substitution was not only made, but we were able to supply roll coverings in every way equal, and sometimes the superior of accepted standards for natural robber rolls.

The type of papermaking machine most widely used is the fourdrinier.

Starting from the wet end and going through to the finishing, we have the first roll which is the breast roll accepted throughout the industry as a bronze shell: however, during the war we were called

ATTENTION:
PAPER MANUFACTURERS AND MERCHANTS

WANTED—Any amount of super-calendered magazine stock — 50 to 60 lb. basis — sizes 34½ by 48½ and 34½ by 24¼.

Frank P. Bennett & Co., Inc. — Publishers
530 Atlantic Avenue Boston, Mass.

GEORGE F. HARDY & SON
Mill Architects & Consulting Engineers
441 Lexington Avenue New York 17, N. Y.
Established 1900
George F. Hardy — John A. Hardy
Members—Am. Soc. C.E.; Am. Soc. M.E.; Eng. Inst. Can.; TAPPI
Consultation — Paper and Pulp Mills
Reports — Hydro-Electric and
Valuations — Steam Power Plants
Design—Complete Plans—Supervision

upon to recommend a cover to replace the bronze shell as it wore out due to the scarcity of bronze. The results in several mills proved successful, and they are still operating with one-half inch of hard stock straight face, lending support also to the thin shell upon which it was covered. This stock operates satisfactorily under the doctoring conditions if the pressure is regulated to a very light touch.

The table rolls are covered with a hard stock, usually 3/16-inch to ¼-inch thick covering, according to machine width; the same would apply to the wire-carrying, wire-stretch, and wire guide rolls applying ¼ inch to ⅜ inch covers at the same density. The table rolls will resist water by kicking it off quicker under the wire than the metal rolls. Some mills prefer using rubber-covered table rolls one-third or one-half way down the wire where the water must be removed quickly. Practically all high-speed machines use these rolls on the complete wet end, rubber-covered rolls being a part of the original specifications.

Longer wire life is the result of the eliminating metal to metal contact, and water, being a natural lubricant for rubber, increases wire life. Our latest type hard stock will not result in hair-line cracks in change of temperatures, of stock or machine room, this is also an advantage when shipping or storing in cold weather in warehouses or stock rooms without heating facilities.

Felt rolls, covered with rubber, are ideal for all machines; however, only in recent years has the trend for using them taken hold on older machines. The cover is usually ¼ inch thick on plain rolls and ⅜ inch on the wormed rolls using a stock with a slight cushion. Again we have water as a lubricant for rubber when used on this type of roll, and the life of these covers is indefinite unless damaged by accident or carelessness. Every rubber company has its own ideas about the worming.

We developed a new type worm which s now accepted on practically every speed machine and is ½ oval ¾-inch wide, 3/16-inch thick and 6-inch centers wormed right and left from the center to the ends. This worming is applied by means of a template and must be absolutely accurate and is not applied in a hit or miss fashion. Our experience with the plants was encouraging when we used this fast narrow worm, keeping the felts open at all times at all speeds with the least amount of friction and "digging-in" of the worm.

Lump breaker rolls can be supplied in natural rubber, and the trend seems to be toward heavier covers at the same density, with machine widths as a factor.

The subject of press rolls would take considerable time, but we can take the over-all picture of the types generally used, which would be from densities ranging from 25 to 65. Many mills are requesting heavier covers that eventually lower operating costs, requiring less trips to the factory for recovering and a far greater cushion even at the same density used with a lighter cover. These covers are now averaging from 1 inch to 1½ inches in thickness, stepping up from the old standards of ¾ inch to 1 inch. Most crowns are determined by the superintendent or plant engineer, taking into consideration speed, stock, formation, pressures and condition of the equipment.

Felt mills now have the additional advantages of synthetic covered press rolls due to excessive use of kerosene in the stock. Heretofore, natural rubber would only operate one half the time, become tacky, soft and lose its elasticity, resulting in excessive corrugations on the roll surface.

One must be very careful when ordering a press roll on the soft densities when using extreme pressures, you must sacrifice either a lighter pressure or harder density, if you do not you are then definitely going into surface corrugations and excessive roll grinding to eliminate the same as it develops; this was a common occurrence when replacing natural covers with synthetic covers.

The use of suction press rolls is increasing on all machines; the trend is to higher speeds, and suction press rolls are giving excellent results. The standard practice for the covering of these rolls is to use rubber of 1-inch thickness, using 30 to 35 density recommended by the roll builders.

Smoothing press and size press roll covers are similar in thickness and density. The size press may require a special stock if the size solution is maintained at a high temperature.

The hard surface roll density will vary with the temperature of the solution; the usual range is from 5 to 20 points.

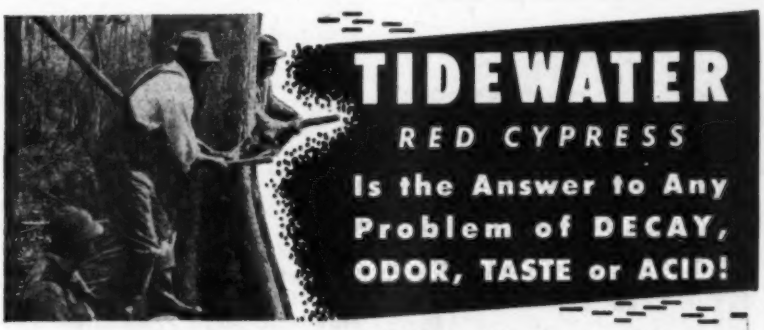
Paper carrying and spring or tension rolls use the same hard rubber stock of ¼ inch thickness. The thickness is increased to ⅜ inch according to machine width.

Recently we have recommended hard rubber-covered rolls using a high crown according to machine width. Thickness of the rubber covering is recommended after the crown is determined. This eliminates the use of spreader bars and V-type rollers to remove paper wrinkles before the paper enters the calender stock. Less tension is required. Paper dust, that usually accumulates with stationary equipment used for spreading, is eliminated.

During the war the U. S. Rubber Company developed a static eliminating stock for use in explosive plants. This rubber stock is now available in any density or thickness and will ground any static built up in the paper or the calender stacks or elsewhere.

Following the machine, comes the finishing department where most plants operate rotary cutters. These cutters use a pinch roll that can be rubber-covered, using a herringbone-design cover. This roll requires little or no attention and will operate for years, giving good gripping qualities. The density of the rubber cover is on the soft but firm side and will not mark the most sensitive paper.

Now we shall start with the cylinder machine, but in order to avoid duplication, we can proceed by stating that the felt carrying, press rolls, suction press



...Its Superior Qualities Make It Ideal for a Wide Range of Industrial Uses

The Indians knew it, the Spaniards knew it, the French knew it, and those of English descent of the Southeastern regions have known for 150 years the superior qualities of Tidewater Red Cypress and its resistance to decay. Along the Atlantic Coastal Plain where lie buried cypress trees that grew over 100,000 years ago in the Pleistocene Age, many of which have since been dug up, give mute evidence of the lasting qualities of cypress never equalled for its decay resistance. In more recent years industry has also learned that it licks the difficulties of odor, taste and acid. Tidewater Red Cypress has ALL the qualities you demand for many specific industrial demands.

Tidewater RED CYPRESS — Trim Red Cypress "The Wood Eternal"

CAN BE FURNISHED FROM ST. LOUIS STOCKS

FLEISHEL LUMBER CO.
4234 DUNCAN AVE. • ST. LOUIS 10, MO. • NEwstead 2100

rolls, smooth and size press rolls are the same as used on the fourdrinier machines. This leaves us with the couch rolls to work on. We have noticed a considerable trend toward thick covers up to 2½ inches, but there is another trend toward a slightly harder density of approximately 50 points.

These covers can now be supplied in natural rubber and synthetic rubber according to the requirements of the application. These rolls are now sealed at the ends over the bond to avoid stock seepage that loosens the bond.

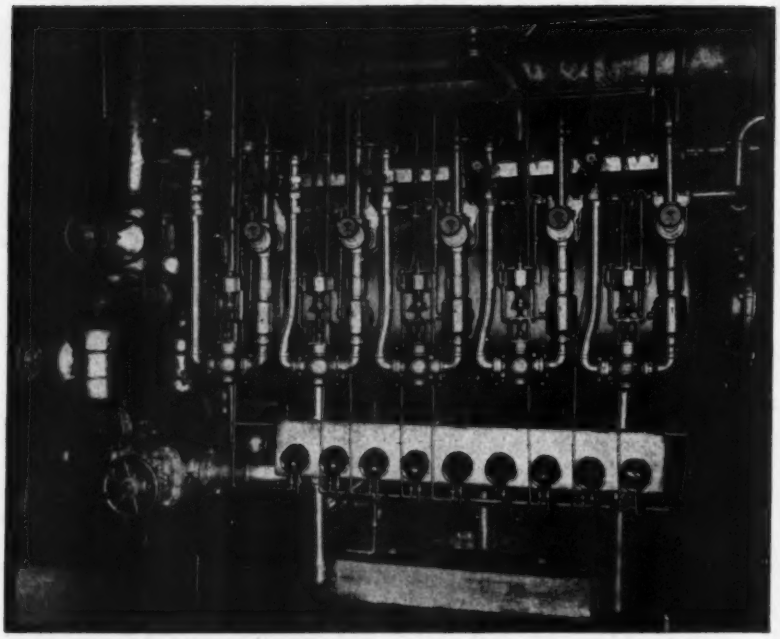
Felt squeeze rolls are recommended with a hard rubber stock on bottom and a good cushion stock on top at a moderate thickness.

The extractor squeeze roll can be supplied in natural and synthetic rubber. The usual thickness of the cover is 1 inch, being increased from ¾ inch as formerly used.

Primary press roll covers are considered similar to ordinary press roll covers. Every superintendent has ideas through long experience as to the density he requires, but, of course, the thickness of the covers on the primary press rolls is not as heavy as the covers on the rolls of the main presses. The density will range from 25 to 65. The crowns will vary also. Some mills like the same readings on all covers, others will vary from 5 to 10 points per roll, running this range from the wet end towards the main press section with the hardest stock. Still others want to change their range of stocks on both top and bottom covers.

The increased use of suction has been a revolutionary development in papermaking. Rubber covers are most important to this application if for no other reason than for the saving in felt costs. Here again the papermaker is dependent upon rubber to enable him to capitalize in technical improvements being made in equipment design.

Of course, there are many rolls used on auxiliary equipment throughout the plant that can be covered to suit the conditions, such as waxing, squeeze, wringer, save-all, decker, and many others. Rubber stocks can be supplied for any of these.



Velocity steam installation in mill of National Container Corporation, Jacksonville, Florida

"Pulsating" Steam Flow—Your Key to Faster Heat Flow and More Production

PAUL HARRISON, President
Velocity Steam Production Engineering

Your problem, the problem paramount in the minds of all paper mill executives, is more production—how to increase production in the drying process.

Your solution to faster drying and more production is faster heat flow. Faster heat flow is now possible through use of the latest theoretical knowledge regarding the many strange phenomena of steam heat transfer.

Experimental and developmental work in steam engineering, with careful study of cause and effect, has led to the discovery of a strikingly simple but surprisingly effective step that can be taken to push the heat transferring capacity of equipment above the highest level heretofore attained. This new step consists essentially in operating a steam system in a pulsating manner instead of in the steady manner characteristic of conventional practice. In a steam system converted to the new heat transferring process, the steam pressure and velocity actually pulsate in short cycles.

In Ohm's law in electricity $I = E/R$. The amount of electric current that flows through a circuit is equal to the potential or electrical driving force divided by the resistance to be overcome. Just so in a steam system the rate of heat transmission is determined by the thermal potential or driving force in terms of temperature difference divided by the resistance to be overcome.

Ohm's law serves as a simple expression of the relationships with which we are dealing. The equation $I = E/R$ represents what is happening in an energy system at any given moment whether the energy system is electrical or steam.

Our general problem is to attain one of two objectives, namely: The objective of achieving a net gain by increasing E without undue penalty in increase in R, the resistance. The second, or alternative objective, is to achieve a net gain by decreasing R without undue penalty in a decrease in E, the temperature.

In pulsating the steam flow, we are seeking the second of these two objectives, the lowering of resistance to heat flow in a steam system.

In general, gain in heat transfer by conversion to the optimum pulsation pattern results in an inerease in production of 7 to 10 per cent.

When operation of the steam system with pulsation flow produces a small pressure drop, liquid surfaces throughout the dryer roll must flash to sufficient extent to satisfy the conditions of the lower pressure. These liquid surfaces are provided by the numerous dispersed water particles together with the condensate film. The water particles vaporize in the

manner of minute explosions with a turbulent and disruptive effect on the gas layer. Since this flashing phenomenon necessitates a terrific expansion of liquid particles, liquid volumes at 35 psi are expanded 500 per cent. Consequently, the resistance of the gas layer to heat transmission is greatly lowered. Further reduction of the total resistance is found in the thinning of the adjacent condensate film by simultaneous flashing.

The paper industry can well afford to consider using 150 pound steam pressures.

This means increasing E in our energy equation. In the past, increasing E, our temperature, generally has meant thicker cylinder walls and increased resistance, R, which is just what we have been talking about decreasing. But, fortunately, there is an answer to this dilemma.

Further reduction of R or thermal resistance in a steam system, even when increasing steam pressures, may be accomplished by taking advantage of a timely development in dryer rolls, the Lukenweld Steel Jacketed Dryer. This dryer is of double walled construction to provide an annular steam chamber of small radial dimension. The substitution of relatively thin steel for relatively thick cast iron substantially reduces the resistance of the metal wall. The reduction in cross sectional area of the steam chamber brings about marked increases in the steam velocity which aids materially in reducing the effective thickness of the gas layer. Reynolds numbers are considerably higher than those found in drum dryers and appreciable increases in heat transfer can be accomplished.

Now let us see how a further gain may be made by increasing E, the thermal potential in an existing steam system.

This helpful step may be taken simply by adding a few high pressure cylinders to a pulsating steam system. It will be noted that where the thermal potential or temperature differential is extremely narrowed by the rising paper temperature, the added pressure rolls provide an abrupt temperature rise to renew the temperature differential. As a result, the temperature of the paper spurts upward and, of course, the rate of travel of the paper may be increased correspondingly.

In no more than 6 to 12 months from now, the paper industry will be shown how to get from 30 to 40 per cent more production over the dryers of existing equipment. Present research indicates this as a certainty.

The Importance of Consistency Control to Sheet Formation

J. R. ALMAND
Union Bag & Paper Corporation

Controlling consistency is one important means of taking the "guess work" and "hit or miss" out of forming a sheet of paper.

It has long been recognized that as the consistency increases, there is more resistance to flow through pipe lines. While this effect is not so noticeable at consistencies below 1.0 per cent, it is quite evident at consistencies in the range of 3—4½ per cent which, of course, is the normal operating range between the decker chest and fan pump. Accurate regulation of any given consistency within this range is not difficult. Over the past couple of years, we have experimented with consistency control devices on eight machines and have finally worked out a system which is giving satisfactory control. We are in process of installing consistency control equipment on all other machines.

We use Brammer regulators, however, the flow boxes are of our own design. The stock is sampled at a point in the stock line to the primary jordans. A sample of about 250 gpm of stock is taken to the regulator. This represents, roughly, 20—25 per cent of the total stock going to the refiners. A constant head regulator feeds a constant supply of stock to the flow-box. The flow-box is the heart of the Brammer regulator, and is designed for a smooth, streamlined flow of stock. The regulator is actuated by the change in head necessary with change in consistency to force a constant amount of stock between two fixed points in the flow-box. This head is measured by bubble pipes which actuate an air controlled water dilution valve. The dilution is at a point ahead of the sampling. The consistency of stock leaving the thickener and entering the decker storage chest may vary over a relatively wide range. It is only necessary, however, that we keep the consistency in this chest at a point which allows good mixing, and somewhat higher than the point selected for control. When the regulator was first installed, there was quite a bit of cycling, and changes in sampling line pressures reflected in the control. However, the kinks have now been ironed out by proper design of a flow-box and the use of snubbers in the bubble pipe lines, and we are quite pleased with the control we are getting. We regulate our stock at this point at 3.75 to 4.0 per cent consistency.

Inasmuch, as there is inherent cycling in the best of regulators, it is important that a blending chest be provided between the point of regulation and the machine. The regulated stock is pumped from the decker chest through jordans to a machine chest. It is important to maintain the consistency, which experience has shown, gives good mixing, minimizes stratification, and at the same time, produces the type of refining desired with a minimum of power. We pump from the machine chest, through more jordans, directly to the machine.

In considering the large number of variables which influence the formation of the sheet, it is difficult to single out just one for discussion without touching somewhat on the others. The uniformity of consistency of the headbox is one of the most important variables involved in producing a good sheet, since a uniform flow of stock and water to the wire is essential for good formation, as well as other sheet characteristics, and this cannot be accomplished without a uniform ratio of stock to water. In considering headbox consistency, however, we realize that it is not possible to set a certain consistency figure to maintain at all times, for conditions in the stock and on the machine vary that require the consistency to be changed. The mechanical elements of control alone cannot be relied upon to yield uniform results.

Some of the things that determine the consistency which should be held in the headbox are:

1st—Characteristics of the stock
2nd—Degree and type of refining
3rd—Length, mesh and weave of wire
4th—Fourdrinier table
5th—Speed

It would be rather ill-advised for me to attempt to give you sets of data listing optimum consistencies to carry in a headbox, at a given speed, which would

"Your Magic Carpet..
MR. SUPERINTENDENT"
●The constant research, careful planning and painstaking design back of every Tenax Felt work magic in their performance on your machines. For every paper, pulp and board, there's a Tenax Felt that will meet, and exceed, the highest technical standards.
TENAX
"TENAX FELTS ARE TOUGH"
LOCKPORT FELT COMPANY
NEWFANE, N. Y.
SERVING THE PAPER INDUSTRY SINCE 1891

result in a given finished sheet characteristic. Paper machines are quite different, and conditions vary widely in different mills. As a matter of fact, I cannot tell my operators to run No. 1 Machine the same as No. 2 has been run when making a certain grade of paper. Conditions differ on like machines in the same mill.

Our grades are mainly: grocers bag, wrapping, laminating, impregnating, multiwall and cement, and liner and corrugating board.

The specifications on each of these grades vary very widely. The one desirable thing in common in the manufacture of each, is that the maximum amount of water be carried in each sheet. We feel that by doing so, and holding the consistency constant, we are, as far as conditions will permit, furnishing the converter a uniform product. A controlled consistency helps to assure the converter of uniform formation in a sheet of paper or board, and this is very important to his converting operations.

Grievance Procedure

E. G. AMOS, Secretary
Industrial Relations Committee
American Paper and Pulp Association

The paper manufacturing field is no different from any other industry and it has its share of grievances, some real and some imaginary.

Sometimes we find management with the attitude that "we must win those grievances," and the same goes for the unions.

ENGINE SETS—GAS AND DIESEL

75 KVA, Electric Machinery, 3/60/220/440 v. AC generator, Oil-Well Diesel 600 RPM.

31¼ KVA, Westinghouse, 3/60/205/120 v. AC generator, with LeRoi gas engine, 1200 RPM.

30 KW, Century, model 8PD, 3/30/127/220 volt, with International model UD14 Diesel, speed 1200 RPM.

15 KW, Allis Chalmers, 110 v. DC, with Wisconsin type A gasoline engine 1000 RPM.

5 KW, Jacobs Wind 32 volts, DC, with Jacobs Engine 12 HP, speed approx. 725 RPM.

5 KW, Globe, 110 v. DC generator with Globe gas type G24 gas engine, speed 1150 RPM.

MOTOR-GENERATOR SETS

KW	Make	AC	DC
1000	Wtg.	3/60/13200	250
1000	G.E.	3/60/2300	600
300	G.E.	3/25/6600	250
300	G.E.	3/60/220	260
150	G.E.	3/60/2200	275
100	G.E.	3/30/2300	250
75	G.E.	2300 gen.	110
75	Wtg.	3/20/440	250

3-Unit M.G. Sets

KW	Make	AC	DC
40	G.E.	3/60/440	110/220
50	Cr.W.	3/60/440	110/220

Chicago Electric Co.
Distributors - Rebuilders - Engineers
1313 West 22nd Street,
Chicago 8, Illinois

Everyone is entitled to justice and when justice prevails, no one loses or gains. When you determine the facts of any case and the issues are settled in accordance with the contract, you will undoubtedly find that a misunderstanding was cleared up or at least an erroneous interpretation clarified.

Grievances are not a new thing that have come to pass since the Wagner Act was passed by Congress, nor are methods of settlement a figment of the New Dealers' imagination, but they have been gradually developed since the Stone Age.

However, there is no question but what many more grievances have come to the surface since the passage of the Wagner Act, for the very obvious reason that employees now have some legal support as well as the support of union business agents who sometimes make it a part of their business to incite their members into presenting grievances.

Grievance procedure throughout the paper industry follows about the same general pattern with a few exceptions. This procedure, as set up in the union contract quite generally specifies that the aggrieved employee will first take the matter up with his foreman. None of the contracts I have read, however, state that foremen have the authority to settle grievances, and we sometimes wonder if he does have the authority, or knowledge or training, which brings me to the first basic principle of the all important grievance procedure, and that is:

Settlement at Point of Origin

1. I believe, and firmly believe, that every superintendent here today; that everyone here today for that matter, who is mixed up in industrial or human relations can well ask himself how much the foreman under him knows, how much authority he has in settlement of grievances and if so, does he know how to go about it? Those in higher authority can also well discuss with themselves whether this foreman or that foreman is qualified to handle the majority of things that come up in that field. Certainly the aim of every mill manager or superintendent should be to have grievances settled at the place they develop, but that can never be achieved until they accomplish principle Number 2 which is:

A Well Trained Foreman

2. This is accomplished, of course, in full co-operation with the personnel department. Training should include: company policies as to promotions, sick leave, safety, transfers, discharge, retirement, hospitalization, wage increases and, in fact every phase of company known policy. This training should embody a detailed explanation of contract clauses as found in the company's union agreement and those in other nearby plants. This training must include some clear-cut definitions as to the foreman's authority to settle certain grievances himself and when he should call on higher authority.

Unless he is so trained, he, the foreman, is in a poor position to represent management and maintain our principle Number 3, which is:

Promptness of Settlement

3. A number of contracts in the paper industry stipulate time limits for each step in the grievance procedure, and while these time limits are important, the undeniable fact still remains that one must or should think of them as maximum time limits, and settle every issue as promptly as humanely possible. A congestion of unsettled grievances can only breed confusion, distrust and discontent, and like acorns that grow to gigantic oaks, so can seeds of imaginary grievances grow until all resemblance to its preconceived form is lost in the inevitable wrangling which is bound to ensue.

I recall a case of a beaterman in one of the mills in Pennsylvania. The beaterman objected to the damp floor and received the answer that the matter would be looked after. Some time elapsed, but with each succeeding day the water got deeper and before it ended—the day I happened to visit the mill, I got the distinct impression that the employee was standing almost to his knees in water, since the whole beater room was ready to walk or swim out of the place. Incidentally, the reason the matter had dragged on for several days was due to the absence of the superintendent who had failed to delegate proper authority to the proper place, which brings us to basic principle Number 4 in our procedure which is:

Delegation and Definition of Authority to the Foreman

4. The area of a foreman's authority shoud be defined clearly and concisely. What is he empowered to settle on the spot, and what class of complaint must he take to higher authority? Certainly one cannot anticipate all the kinds of grievances that will arise, but just as certainly a rough classification can be made in the interests of speed and precise management. That coupled with my basic principle Number 5, will go a long way in keeping things under control. My Number 5 basic principle consists of:

Keeping Everyone Concerned Informed on Decisions Relating to Grievances

5. You are well aware that a vast majority of grievances are not covered by contract provisions, precedent, policy or tradition. But likewise, since each settlement tends to start perhaps a policy, or leastways a trend, it is of utmost importance that all foremen in the department and in all departments know what the grievance was and how it was settled. They should have all the facts, not next week, but right away—since gossip can travel extremely fast, even in the best run shops or plants, and unless you can beat it to the punch, it can be distorted to the point where you will fail to recognize your own baby, and you may wind up by having two different decisions being made on similar cases. Then if you use Number 6 principle which is:

6. Grievances should, as a matter of good procedure, be presented in writing: your problems will be partially solved at least. By following this procedure of written grievances, you will not only be able to keep the number to a minimum, but in addition, you will have a written record on the cause of complaint, and settlement or action taken. Many mills

have forms for this with spaces for time checks, action taken, etc.

Arbitration

While I have consumed most of the time allotted to me in discussing the first step, I feel quite strongly that they should be settled there if at all possible. However, there comes a time and class of grievance that must go to higher authority, and the well written contract will provide those steps. Most of the contracts provide the following:

(1) Reference to foreman by employee; (2) To superintendent and shop grievance committee; (3) To manager by grievance committee; (4) To national or industrial office of union and company top management; (5) To arbitrator, umpire or someone in like capacity.

Under Step 5, some companies appoint one man, the union one man and they select a third. This, of course, quite largely places the burden on the Number 5 man.

There is some tendency in the paper industry toward specifying the American Arbitration Association, and no doubt this trend would be much faster if the industry were beset with a large number of grievances that passed beyond the first or second steps.

Conclusion

In conclusion, I wish to commend the attitude of the Superintendents Association, which has today, and many times in the past, placed itself on the receiving end of industrial relations information. I firmly believe that this attitude has a great deal to do with the fact that we have so few major work stoppages in the paper industry.

The superintendents and their staff are, as has been said many times, the real administrators of any industrial relations policy in their company. By continued insistence in current information and sound policies, with adequate authority to pass on such authority to well-trained foremen, I believe, is the best method by which superintendents can be of greatest help in an industrial relations program.

The following abridgment is from a paper presented at the annual meeting of The American Pulp and Paper Mill Superintendents Association, held in Poland Spring, Maine, June 17-20, 1946.

Possibilities of the New Dandy Roll Drive

PETER S. SINCLAIR, President
The Sinclair Company

It has long been our contention that:

1. A dandy roll driven by the sheet distorts the formation to a considerable degree.

2. A dandy roll driven by the sheet must be made very light to reduce the power necessary to turn the roll.

3. A light-weight dandy roll is very readily injured by steam and by handling, and has not been too satisfactory in performance on the faster running machines.

Again, we felt that with a driven dandy, such complaints as the seam moving out of place, and wrinkling of the cover, could and would be eliminated. We also felt the dandy roll drive would permit the use of larger diameter dandy rolls, solidly built to withstand sag and vibration. In other words, we felt the dandy roll should reflect the dimensions and conformity of a press roll, and if driven, this would be possible. We also felt that a true dandy roll just touching the sheet would eliminate a great puddle, and would eliminate the pressure of the roll against the sheet, permitting the sheet to ride through the machine with better formation, less worms, 'licks' and streaks, and of course, less water would tend to climb up with the dandy roll as it left the sheet. Finally, we were all agreed that if the dandy roll did not ride the sheet as in a free dandy, less filling of the wire mesh would occur, finer meshes would be permissible, or at least lighter constructed wire cloth could be used, reducing to a minimum the wire mark caused by the dandy roll.

Well, to sum up our hopes, we have enough of these rolls running at the present time to indicate that the factor of improvement that we were banking on has taken place. We can definitely say that at the present time, we do know that:

1. The dandy roll covers last longer with the drive than they ever did without a drive.

2. There is less tendency to fill up the covers than we have ever experienced.

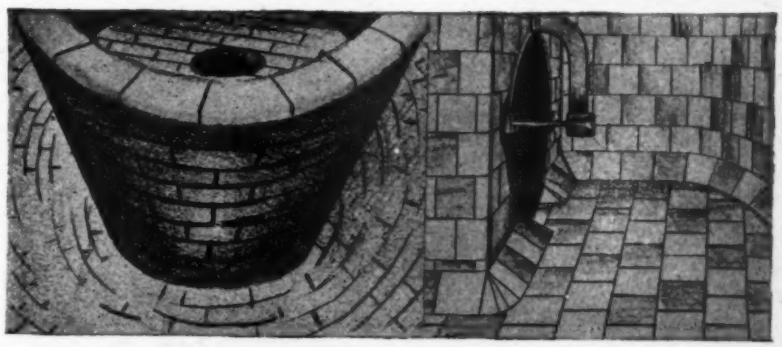
3. The wire cloth covering does not become spotted with pitch.

4. Certain grades of paper which have been trouble makers in the past show a definite improvement in the appearance of the sheet, especially in the appearance of a watermark.

5. There is very little licking and picking.

6. We have reduced the puddle at the dandy roll to very little excess water at this point, permitting better action of the suction boxes beyond the dandy.

In other words, wherever we have put these drives, we find the mills are quite satisfied with them. Our arrangement of the drive is very simple. We tie in a direct current generator to the couch roll, or other drive shaft, and a direct current motor is mounted on the dandy roll stand. In between the two, we install controls to make possible very fine adjustments so that the wire speed and the dandy roll speeds can be made exactly the same. We drive the roll with "V" belts, and to date haven't had any serious trouble with this phase of the installation. We have a number of these rolls in operation, and a number in process of manufacture.



Practically Complete Coverage

A check of the newer (post-war) bleach plants on the North American Continent shows that practically all of them contain Stebbins linings.

This coverage is the result of working for 62 years with pulp and paper men in designing, installing and servicing linings and tile tanks exclusively.

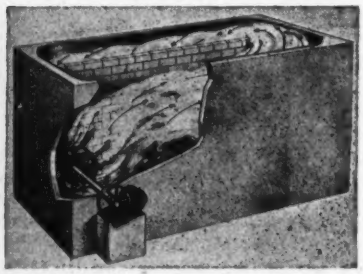
This service has saved pulp and paper manufacturers many thousands of dollars. Ask a Stebbins lining or tank specialist to work with you on your next lining or tile tank job.

Stebbins Engineering and Manufacturing Company
EASTERN BOULEVARD, WATERTOWN, NEW YORK

NEW EQUIPMENT AND SUPPLIES

Axial Flow Agitator

D. J. Murray Manufacturing Co., Wausau, Wis., has announced an axial flow agitator for stock chests of two-compartment design. The agitator is made of suitable metals to handle various chemicals and in sizes to move from 3,000 to 20,000 gal. per min. (including velocities from 5 ft. per sec. to 17 ft. per sec.) sufficiently to prevent segregation of solids and fibers and also prevent settling of stock. To make an installation, which may be from either side or end of chest, the agitator impeller, of axial flow design, is mounted in the partition wall. In operation, this impeller pumps the stock from one side of the chest and delivers it to the other.



Clarifier for Turbid Water

A clarifier for turbid water, designated as the *Liquon Sludge Contact Reactor*, has been announced by the Liquid Conditioning Corporation, 423 West 126th Street, New York 27, N. Y. This device combines the operations of mixing raw water with coagulating chemicals, agitating the mixture, maintaining a suspended deep sludge bed or blanket of previously accumulated precipitates, separating the clarified water from the sludge, and concentrating the impurity-saturated sludge for minimum volume of blowoff.

This sequence of operations is accomplished as follows (see accompanying sketch):

1. The precipitated impurities which form a sludge with the coagulating chemicals are recirculated as indicated by the arrows, so that all of the chemical in the tank is utilized and so that there are no dead areas in the tank.

2. Settling out and depositing of sludge on the floor of the tank are prevented by the slow-moving agitator which operates over the entire bottom of the tank.

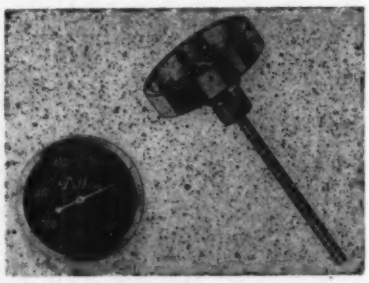
3. The clarified water is separated from the sludge by horizontal outward radial flow with gradually decreasing velocity.

4. The sludge concentrator collects and thickens some of the sludge for blowoff by automatic desludging devices, keeping the top of the suspended sludge at the optimum level for best chemical results consistent with the clearest effluent.

According to the manufacturer, the Reactor, in addition to its use as a water clarifier, is adapted equally well for softening of hard well waters by lime-soda, for simultaneously softening and clarifying hard river waters, and for the removal of iron, manganese, silica or fluorides from water.

Stainless Steel Thermometer

W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago 44, Ill., has announced a thermometer with a ¼ in. diameter 18-8 stainless steel stem, a mounting nut with a ½ in. standard pipe thread, and either a 3 in. or 5 in. diameter Fahrenheit dial (Centigrade dial also available on order). The stem commonly

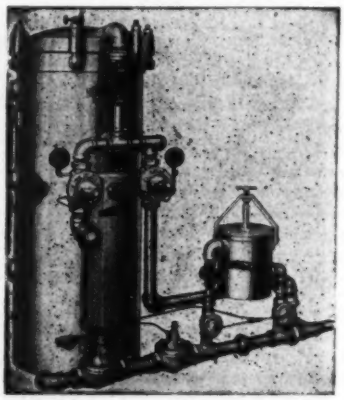


is either 5 in. or 9 in. long; but special lengths may be ordered. The pointer is fixed to a stainless steel shaft, and the shaft, in turn, directly to thermometer coil.

Accuracy is claimed to be within one per cent of the range over the entire scale, overload accuracy being unaffected up to 50 per cent above 500 deg. Fahr. range, and up to 10 per cent above 750 deg. Fahr. range.

Line of Water Filters

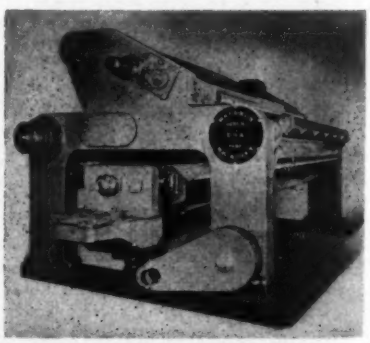
Bowser, Inc., Fort Wayne, Ind., has announced a line of water filters, Fig. 611 Series, with a range in capacity from 15 to 500 gpm. The filter elements are



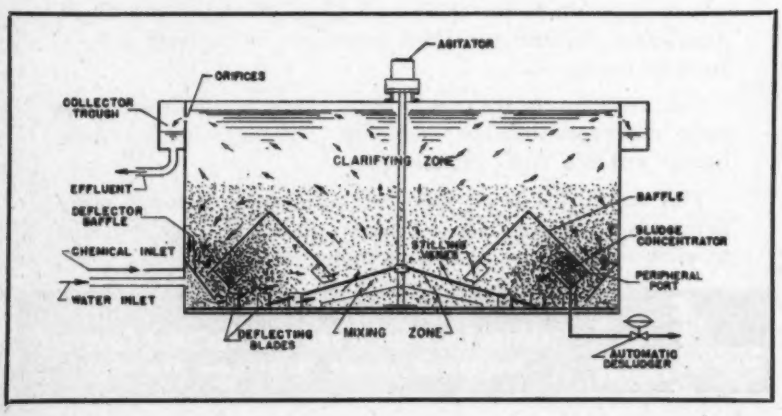
tubular, plastic-impregnated cartridges upon which diatomaceous earth is deposited. These elements, according to the announcement, remove particles as small as ½ micron (approximately .00002 in.), including all dirt, oils, and other foreign matter to produce filtered water of unusual clarity. Filtered impurities are periodically backwashed to waste.

Paper Coating Machine

John Waldron Corp., New Brunswick, N. J., has announced a new coating machine, the *Microjet Coater;* which, according to the announcement, constitutes the first completely co-ordinated machine to replace the groups of individual pieces of equipment that heretofore have been as-



sembled for such work. With this machine, the coating is applied through the medium of a roll in excess amount; the excess being planed off and the amount of coating left on the surface being uni-



Confidence

For more than forty years Morehead Tilting Type Steam Traps have been providing users of steam heated equipment with dependable, efficient service. The kind of service that merits confidence in a company and its products.

We have never made a claim for our product that is not substantiated by the experience of users. Many Morehead Traps are today supplying owners trouble free service after more than thirty years of use. Service parts are always available for any Morehead trap ever built.

Write today for more information on Morehead Tilting Type Traps, outline your use of steam and receive our suggestions for improving the efficiency of your system.

Morehead Manufacturing Co.

2457 W. WARREN AVE. DETROIT 8, MICH.

Sandy Hill
IRON & BRASS WORKS
PAPER MACHINERY SPECIALISTS • HUDSON FALLS, N. Y.
BUILDERS OF SANDY HILL, BERTRAMS AND KAMYR EQUIPMENT

CARTHAGE MACHINE CO.

• • •

CARTHAGE, NEW YORK

Machinery for Ground Wood and Chemical Pulp Mills.

HARDY S. FERGUSON & COMPANY
CONSULTING ENGINEERS

200 FIFTH AVENUE NEW YORK 10, N. Y.

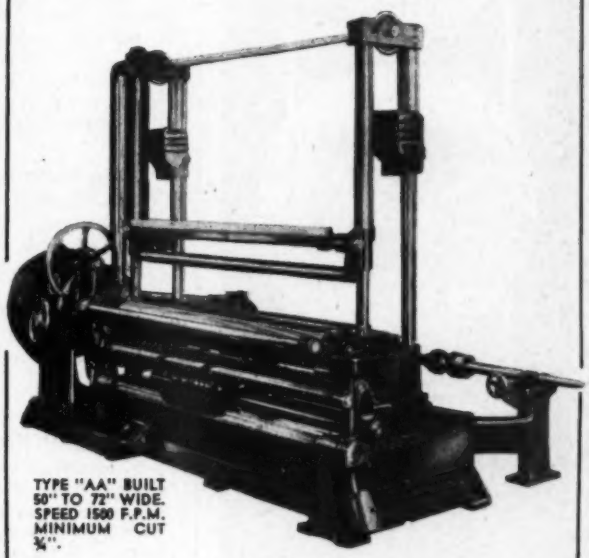
Hardy S. Ferguson—Member A.S.C.E. A.S.M.E. E.I.C.
Moses H. Teare—Member A.S.C.E A.S.M.E. E.I.C.

Consultation, reports, valuations, and complete designs and engineering supervision for the construction and equipment of

- *PULP AND PAPER MILLS AND OTHER INDUSTRIAL PLANTS*
- *STEAM AND HYDRO-ELECTRIC POWER PLANTS*
- *DAMS AND OTHER HYDRAULIC STRUCTURES*

LANGSTON

Slitters & Roll Winders

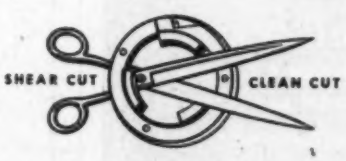


TYPE "AA" BUILT 50" TO 72" WIDE. SPEED 1500 F.P.M. MINIMUM CUT ¾".

LONG-PLANNED IMPROVEMENTS ARE NOW AVAILABLE IN LANGSTON SLITTERS AND ROLL WINDERS, NEW MOUNTING AND ADJUSTMENT OF THE SLITTER ELEMENTS FOR INSTANCE, GREATLY REDUCE THREAD-UP TIME; PERMIT UNIFORM ADJUSTMENT OF ALL BLADES. SLITTER LIFE IS EXTENDED—MAINTENANCE AND DOWN TIME CONSIDERABLY REDUCED.

WHEREVER PAPER IS PROCESSED; IN THE MILL, THE FINISHING ROOM, OR THE CONVERTING PLANT—LANGSTON SLITTERS AND ROLL WINDERS ASSURE DEPENDABLE, TROUBLE-FREE SERVICE.

SAMUEL M. LANGSTON CO., CAMDEN, NEW JERSEY



formly distributed by an air blade fitted with a slot.

In addition to this coating device, designated as the Microjet coating head, the equipment includes an air compressor and tension control attachment, a flying splice unroll stand, a straight pass conveyor type air dryer, a tension control unit and an automatic winder. All drives are enclosed. Also the complete system is fitted with a variable voltage drive and loop control device, as well as moisture regulating and recording instruments.

The manufacturer suggests the machine for the application of aqueous coatings, emulsions, gums, resins, asphalts, and other coatings.

A New Adhesive

The Norton Company, Worcester, Mass., has announced a new aluminum oxide abrasive in which each grain is a complete, single crystal. According to the announcement, the chunky shape of the grains, plus more uniform bonding due to this high purity, gives long wheel life and freedom from frequent dressings.

The product is designated as 32 *Alundum* abrasive.

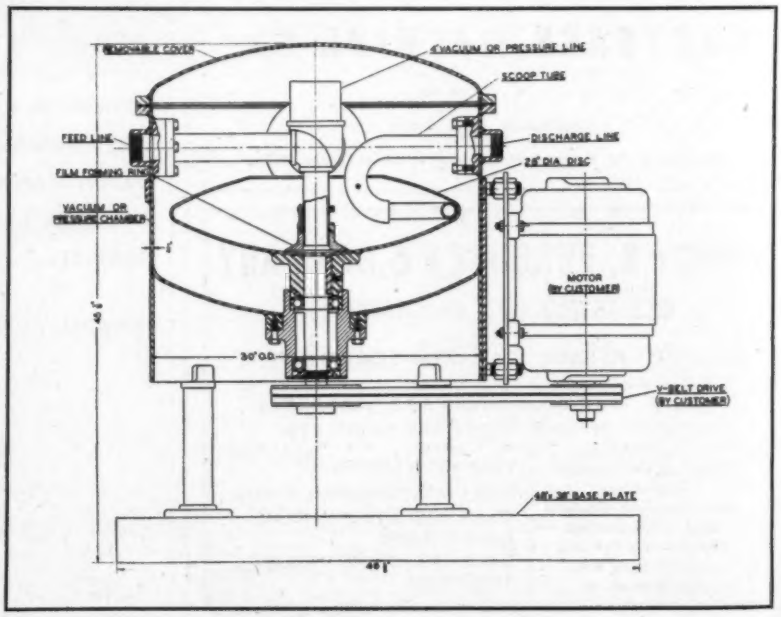
Centrifugal Processing Machine

A centrifugal processing machine of wide versatility, designated as the *Versator*, has been announced by The Cornell Machine Company, 101 Park Ave., New York 17, N. Y. It consists of a vacuum or pressure chamber in which a 26 in. diameter disc in the form of an open bowl operates at high speed.

According to the manufacturer, the machine can be used for homogenizing; emulsifying; reversing emulsions; dispersing solids in liquid vehicles; impregnation; wetting, or hydration of fibers or solid particles; and numerous other applications.

Through-put capacities range from 10 to 100 gpm. Disc speeds may be as low as 900 rpm., but the optimum speed for most operations is about 1800 rpm. Power consumption is under 7½ hp. for viscosities no greater than those of heavy lubricating oils and somewhat higher for more viscous materials.

The machine is available in steel, stainless steel, nickel, Monel, Everdur, etc.



RODNEY HUNT
ROLLS
STRONGER
LONGER LIFE
WOOD
METAL
RUBBER
PLASTIC
PATENTED
"SHAF-TITE"
CONSTRUCTION
RODNEY HUNT
MACHINE COMPANY
38 Maple Street, Orange, Mass., U.S.A.

An EXTRA MEASURE of QUALITY

Today's Swing is to
DARNELL CASTERS
For light or heavy duty service Darnell Casters and Wheels are made for a long life of trouble-free usage, to protect floors and increase employee efficiency.
A SAVING AT EVERY TURN
DARNELL CORP. LTD
LONG BEACH 4 CALIFORNIA
60 WALKER ST. NEW YORK 13 N Y
36 N. CLINTON CHICAGO 6 ILL

BOWSER
ESTABLISHED 1885

LUBRICATING SYSTEMS

for

PAPER MILLS

For more than fifty years Bowser lubricating equipment has been serving the paper industry dependably and efficiently. There's a Bowser unit for every paper mill requirement . . . oiling the bearings of dryers, calender stacks, Jordans, hydrafiners . . . complete systems for compressors, Diesel engines, pumps and other mill equipment.

The Bowser staff of lubrication engineers is always available . . . at no cost or obligation . . . to consult with paper mill men on lubricating equipment for any particular need. For reliable lubrication counsel, call Bowser.

BOWSER Inc.

1315 Creighton Avenue
Fort Wayne 2, Indiana

Liquid Control Specialists SINCE 1885

TEAM UP THESE

ATKINS

"Silver Steel" SAWS

to cut the cost of cutting pulpwood

"Cut costs—with the cost of everything that goes into finished paper going up?"

Sure!—by shaving a little off production costs here—a little more there . . . by going over every operation to see if it can be done more efficiently.

Go back into the woods—see if keen-toothed, "segment ground" Atkins "Silver Steel" Crosscuts in the hands of cutters won't deliver logs at lower cost. Go into slasher operations. See if Atkins tough, "Silver Steel" Circulars, singly or in gangs, won't cut logs into chipper length...faster, with less time-out for blade servicing. These saws are doing a cost-cutting job for scores of producers. They'll do it for you... just say "Atkins" on your next crosscut or circular order.

ATKINS

E. C. ATKINS AND COMPANY
Home Office and Factory: 402 S. Illinois St., Indianapolis 9, Ind.
Branch Factory: Portland, Oregon
Branch Offices:
Atlanta • Chicago • New Orleans • New York • San Francisco

TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Resin Acids

The authors discuss briefly the production of rosin especially in France, together with some data on its industrial use. The constitution of the resin acids in colophony is also treated and the most recent structural formulas of abietic acid, d-pimaric acid, and l-pimaric acid (and the condensation product of the latter with maleic acid) are given. However, abietic acid receives the most attention, with respect to its acid function, its unsaturation, its oxidation, and its dehydrogenation, and the changes in the acid caused by heat. The pyroabietic acids are treated very briefly. A section is devoted to the rosin-sizing of papers (both "acid" and "neutral" sizing), and to the methods used for determining size resistance and the effect of sizing on brightness and on paper strength. The effect of aging of sized papers (by exposure to ultraviolet light) on their strength is also discussed. In general, papers sized with dehydroabietic acid show less yellowing and are somewhat stronger than are those sized with ordinary rosin.

In all cases, unsized sheets made from sulphite pulp, showed a higher tensile strength, both before and after exposure to ultraviolet light. The strength of the sheets was decreased materially when acid sizing at pH 4.5 was used as compared with neutral sizing at pH 7. Dehydrogenated rosin also shows an advantage over ordinary rosin size. René Lombard and Marcel Chêne. *Chimie & Industrie* 56, No. 4,271-81 (1946) (in French).

Analysis of Fabrics, Papers and Boards Containing Wool and Asbestos

Methods for the determination of wool include microscopic examination, solution in 10% sodium hydroxide, removal of vegetable fibers by means of sulphuric acid, and the Kjeldahl method for nitrogen determination. The latter gives the most accurate results and is recommended where the demands for accuracy are dominant. The acid treatment (which is often adequate) is as follows: 5-10 g. of the dry sample cut into small pieces were heated with distilled water for 10-15 minutes, cooled, filtered, pressed, shaken with 95% ethanol, filtered and again pressed. Thereupon the sample was shaken mechanically in a 2 liter glass-stoppered flash with 300 cc. 80% sulphuric acid for 3 hours. The mixture was then diluted with 1 liter of water and the residue was washed first with aqueous ammonium hydroxide and finally with water. It was then dried at 100 for 3 hours and weighed. Subsequently it is ashed.

The weight of wool is computed as the weight of the dry (*acid extracted*) paper minus the weight of ash. The greatest error is introduced when groundwood is present, which normally leaves a 6% residue in the acid treatment for which due correction must be made. The percentge of asbestos in a two to five gram sample of paper is determined by heating for several minutes with aqueous sodium hydroxide, followed by shaking in a flask, filtration, and washing. The residue is then ignited.

The percentage of asbestos equals the weight of ash times 10,000 divided by 85 times the weight of the original paper sample. Ignition of the original, untreated sample of paper gives an index as to whether other inorganic matter is present in significant amount, and a corresponding correction must be made if this is the case. A scheme of analysis is given for a sample containing wool, asbestos, cotton, jute, and sulphite pulp. P. Goldsmid. *Papeterie* 68, No. 2, 34-5, 37-9, 42 (1946) (in French).

The Manufacture of Abrasive Papers

European practice in the making of abrasive sheets is given in considerable detail. The operations are illustrated by means of four drawings. The principal abrasives used are glass, emery, flint, corundum and carborundum. In fixing the abrasive on the paper, hide and/or bone glue is usually used. In certain cases, however, Bakelite and other synthetic resins are employed. The weight of the papers may vary from 50 to 280 g. per sq. meter, but the usual range is 115-125 g. sq. meter. Rag stock as well as bleached and unbleached chemical pulps are used. The best grades often contain manila hemp. The colors are usually kraft brown or blue. Papers must be pliable and free from blisters. In special cases, the paper base is impregnated with linseed oil and paraffin and then coated with a layer of linseed oil containing copal or dammar resins over which the abrasive is then dusted. Anonymous. *Papeterie* 68, No. 4, 110-14 (1946) (in French).

Chemicals Imparting Wet Strength to Paper

When trimethylol melamine resins are dissolved in dilute hydrochloric acid, and the mixture diluted, colloidal solutions are formed from which the resin can be precipitated on the cellulose fibers. Paper made from such pulp has a high wet strength. The need of clearly defined specifications and data for making reproducible melamine solutions is stressed. A study was made of the melamine resin colloid. The colloid carries a positive charge and the coagulation is effected chiefly through the influence of negative ions. The reaction between the colloid and the pulp is rapid and irreversible. The amount of the resin that is precipitated on the fiber increases under the following conditions: (a) with increasing concentration, (b) with increasing amounts of ions present in the solution (especially hydroxyl ions), (c) with prolonged beating of the fiber, (d) with increasing number of polar groups on the fiber.

The process involves a mutual precipitation of two colloids with opposite charges. A laboratory procedure is described for determining the optimum conditions for any individual mill, before large scale operations are resorted to. No general rule can be given however, largely because of differences in the composition of process waters in use in the various mills. Addition of the resin has little effect on the dewatering characteristics of the stock. When a mill is equipped with flotation save-alls, no alum or animal size is required when the operations are carried out at lower pH values. The results of about 2500 laboratory experiments on wet strength of melamine-treated papers are discussed, together with an evaluation of the experimental data as applied on a mill scale. When the maximum wet strength is required, an aging or curing period is required. The process was studied at different temperatures and hydrogen ion concentrations. The following hypotheses have been advanced for the high wet strength of melamine treated pulps:

(I) the effect may be ascribed to the formation of water-resistant ether compounds between the resin and the hydroxyl groups of the pulp.

(II) the effect may be considered the consequence of preventing the relaxation of tension during shrinkage of the gel, when the pulp is dried.

The latter hypothesis finds support in the differences observed between the water adsorption isotherms of unsized and melamine-treated papers. Borje Steenberg. Svensk Papperstidn. 49, 311-23 (1946); through Bull. Inst. Paper Chem. 17, 44.5 (1946).

Stream Pollution Hazards of Pulp Mill Effluents

The various types of effluents resulting from the usual mechanical and chemical pulping operations are described, and their effects on aquatic life are outlined. Thus the author describes the blanketing effect of wood pulp, reduction of dissolved oxygen in the water, the toxic action of dissolved substances, and the odors produced.

Summarizing the hazards to fish and aquatic life, the author deals with the effects of loose fiber pollution which may produce a matting effect thus destroying fish food and the spawning grounds, thus directly damaging the fish themselves. Toxic effects may result from wood extractives and also from chemical waste products. Furthermore, the oxygen demands of the various organic substances may cause a great reduction in the dissolved oxygen of the stream. Cumulative and specific toxic effects are discussed. There may also be an unpleasant taste in the fish caught in a stagnant area below a paper mill. B. A. Westfall. U. S. Fish and Wildlife Service; Fishery Leaflet 174. (mimeographed) (1946) through Bull. Inst. Paper Chem. 17, 38 (1946).

When You're Cramped for Space...

NORMA-HOFFMANN EXTRA LIGHT PRECISION BEARINGS — available in both ball and roller types—offer engineers and designers the advantage of high anti-friction efficiency combined with compactness and light weight. In many cases, they have proved to be the only solution of problems where friction-free operation must be had, in extremely restricted space.

Made to inch dimensions, the "S" and "XLS" BALL BEARING series cover a size range from ⅛" to 22½" bore; and the "RXLS" ROLLER BEARING series ranges from 1⅜" to 22½" bore.

Our Field Engineers are at your service, to aid in selecting and applying these light bearings to your purposes. They will gladly put their experience to work for you. Write for the Catalog.

NORMA-HOFFMANN
BEARINGS CORPORATION
Stamford, Conn. Established 1911 — Precision Ball, Roller and Thrust Bearings
FIELD OFFICES: New York • Chicago • Cleveland • Cincinnati • Pittsburgh • Detroit
Los Angeles • San Francisco • Seattle, Wash.

POOLE

A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY — WOODBERRY, BALTIMORE, MD.

SPEED Screen Plate Cleaning With Oakite Steam Gun!

WHEN you use the Oakite Steam-Detergent Gun for cleaning screen plates, you eliminate both brushing and soaking. Combining heat, mechanical force and vigorous detergent action of Oakite cleaning materials, this fast Oakite cleaning technique thoroughly removes slime and dirt in a fraction of the time usually required by manual methods. Send for FREE copy of 28-page Paper Mill Booklet giving details.

OAKITE PRODUCTS, INC., 18 Thames St., NEW YORK 6, N. Y.
Technical Representatives in Principal Cities of U. S. & Canada

MATERIALS
METHODS
SERVICE

OAKITE
REG. U. S. PAT. OFF.

Specialized Industrial Cleaning

PAPERMAKING PATENTS

IN THE UNITED STATES—Compiled by James Atkins, Registered Patent Attorney

Inquiries should be addressed to James Atkins, Munsey Building, Washington 4, D. C.

Apparatus for Producing Pulp

Patent No. 2,396,587. Karl Assar Uno Lowgren, Tarrytown, and Alf Adolf Alfsen, New York, N. Y., and Hjalmar S. Messing, New Orleans, La., assignors to American Defibrator, Inc., New York, N. Y., a corporation of Delaware. Application March 20, 1941, Serial No. 384,280. 4 Claims. (Cl. 92—7).

1. In apparatus for producing pulp, a conduit of substantial length having a conical bore, means for feeding material to be treated into said conduit, said bore increasing in diameter away from said feeding means, means for introducing steam into said conduit adjacent to its smaller end, an abrading means, means forming a chamber of substantial volume and vertical extent, said conduit communicating with the upper end of said chamber, a rotary table at the bottom of said chamber, a trough below said table for receiving material discharged from said chamber by said table, and means for conveying the material from said trough to said abrading means, said conduit, feeding means, chamber and abrading means being constructed to maintain fluid pressure well above atmospheric.

Purification of Wood Pulp

Patent No. 2,385,259. William R. Collings, Richard D. Freeman, and Martin J. Roberts, Midland, Mich, and Willis O. Hisey, Syracuse, N. Y., assignors to The Dow Chemical Company, Midland, Mich., a corporation of Michigan. Application May 10, 1943. Serial No. 486,346. 2 Claims. (Cl. 92—13.)

1. In a cold purification process for the production of at least 97 per cent alpha-cellulose from wood pulp, the steps which consist in: steeping chipped pulp at from 7 to 15 per cent consistency with a unit volume of aqueous sodium hydroxide of from 8 to 15 per cent concentration; displacing a first effluent liquor consisting of about one-half unit volume of the steeping liquor with a first wash liquor of from 4 to 6 per cent sodium hydroxide; providing a second wash solution of sodium hydroxide of from 1.5 to 2.5 per cent concentration and displacing therewith about one unit volume and a second effluent liquor from a steeped and once washed batch of pulp; displacing with about one unit volume of water the said second wash liquor as a third effluent liquor from a steeped and twice washed batch of pulp; and washing with water until substantially free of sodium hydroxide, and discarding further effluent from the so-purified pulp, while: recovering from the said first effluent by dialysis and dilution, about one-half unit volume of sodium hydroxide solution of from 4 to 6 per cent concentration and cycling this to serve as the first wash liquor for another batch of steeped pulp; cycling the said second effluent liquor for use together with added sodium hydroxide as the steeping liquor for another batch of unpurified pulp; cycling the said third effluent containing from 1.5 to 2.5 per cent sodium hydroxide for use as a second wash liquor for a steeped and once washed batch of pulp; and repeating the cycle on successive batches while recovering purified pulp as the final step in the process.

Drive for Paper Manufacturing Machines

Patent No. 2,387,421. Alfred Vanden Bergh, Green Bay, Wis. Application February 28, 1944. Serial No. 524,275. 1 Claim. (Cl. 74—55.)

In combination with the diaphragm of a pulp screening apparatus used in paper manufacturing machines, a horizonal drive shaft, a frame through which the drive shaft operates, a cam mounted on the drive shaft, within said frame, a horizontal guide bar, comprising a central semicircular portion or housing and straight horizontal end portions, a circular roller of a diameter substantially equal to that of the cam, mounted in the central semicircular housing of the guide bar and working against the edge of the cam, a vertical endwise movable rod, connected at its lower end to the central housing of the guide bar and movable with the latter, perpendicular guide rods for the straight horizontal end portions of the guide bar, cylindrical sleeves extending through the top member of the frame, and coil compression springs disposed around the upper ends of said perpendicular guide rods between said sleeves and the end portions of the guide bar.

Papermaking Apparatus

Patent No. 2,388,627. George S. Witham, Hudson Falls, N. Y. Application October 9, 1940. Serial No. 360,443. 1 Claim. (Cl. 92—46.)

The combination in apparatus of the class described of a vat having a foraminous cylinder rotatable therein and provided with an inlet means for paper stock at one side of the cylinder and an outlet means at an end of the cylinder to facilitate the admission of water including paper fibers into the vat through said inlet and through said cylinder and out said outlet, said inlet means provided with a vertically disposed chamber in communication therewith for a column of paper stock and valve means disposed between said chamber and said vat, a float in said chamber for movement up and down as the level of the column of paper stock in the chamber raises and lowers, connections between said valve means and float whereby the former is opened and closed accordingly as the float is moved down and up thereby to maintain a predetermined level of paper stock in the vat, said outlet means provided with a discharge means of predetermined area for a predetermined water discharge and a vertically disposed discharge chamber in communication therewith between the discharge means and said vat for a column of water, a float in said discharge chamber for movement therein up and down as the level of the column of water in the chamber raises and lowers, and means for indicating the level of water in the discharge chamber operably connected to said float, all adapted and arranged whereby paper stock is maintained at a predetermined level in said vat by the valve means and first named float and the discharge of water at the discharge means is maintained at a predtermined rate so that variations in the consistency of stock in the vat results in more or less water passing out the outlet means and brings about variations in the level of the float in the discharge chamber to operate the indicating means connected thereto to indicate variations in the consistency of the paper stock.

Process for Making Jordan Engine Linings

Patent No. 2,390,351. Archer Le Roy Bolton, North Andover, Mass.; Archer L. Bolton, Jr., executor of said Archer Le Roy Bolton, deceased, assignor to John W. Bolton & Sons, Inc., a corporation of Massachusetts. Original application July 3, 1940. Serial No. 343,832. Divided and this application July 28, 1941, Serial No. 404,311. 1 Claim. (Cl. 18—59).

The steps in the process of making a bodily transportable, unitary lining for Jordan engines which consists of holding knives in spaced relation in a predetermined position forming a hollow truncated cone, by means of an inside form, by spacing means, and means to close the ends of the space between each pair of knives to form pockets; of turning the assembly so that the pocket between a pair of knives is horizontal and open at the top; of filling part of that pocket with a moldable plastic; of turning the assembly until there is another such pocket which is horizontal and open at the top; of so filling part of that pocket; and of continuing to so fill such pockets around the circumference.

Manufacture of Paper of Good Wet Strength

Patent No. 2,384,632. Kenneth J. MacKenzie and Robert S. Bryce, Rochester, N. Y., assignors to Eastman Kodak Company, Rochester, N. Y., a corporation of New Jersey. Application December 10, 1940. Serial No. 369,430. 4 Claims. (Cl. 95—8.)

1. A photo tissue essentially consisting of an absorbent paper sheet, characterized by high wet strength and high water absorbency, having substantially uniformly distributed therein 1-10% of a stable, resinous, water-soluble polymeric reaction product of polyhydric alcohol and boric acid, and not more than 5% of a water-dispersible paper-sizing material, which paper sheet has a photo-sensitive gelatin layer thereon.

Kalamazoo Glazed Tile TANKS and CHESTS

Why experiment in tank construction when this proved, practical and dependable type of construction is now available?

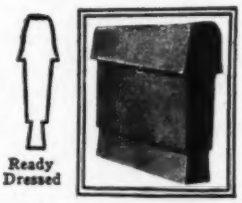
The material that is enduring, clean and adaptable to any size or shape.

Consult Kalamazoo engineers for planning any type of tank or chest.

KALAMAZOO TANK & SILO COMPANY
KALAMAZOO MICHIGAN

"READY DRESSED" MILL COGS

LABOR SAVING — TIME SAVING



The Most Economical Filling That Can Be Put in a Mortise Wheel.

Ready Dressed

Blank Head

We Make Any Style or Size Wanted.

Write for Instruction Sheet "O" Which Is Free.

QUICK SERVICE ON ALL SIZES

THE N. P. BOWSHER CO., South Bend, Ind.

COLORS . . .
for Board and Paper

Green Chromium Oxides
Black, Brown, Red, Yellow Iron Oxides
Lamp Black—Umbers—Venetian Reds—Yellow Ochres

C. K. WILLIAMS & CO.
Easton, Pennsylvania

Faster production of Better Rolls

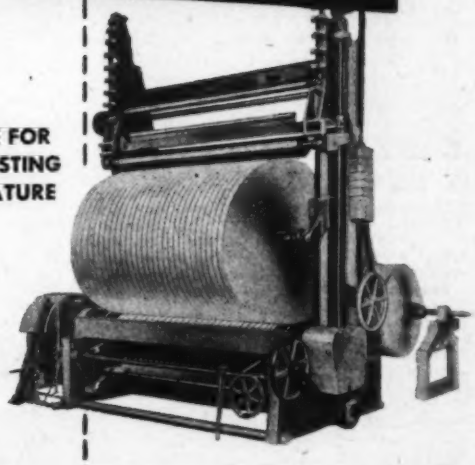
CAMACHINE 18

For paper and paperboard. Web widths 73" to 162" on paper, 73" to 142" on board. Speeds up to 2600 fpm on paper, 1200 fpm on board.

CAMACHINE 10-14D

Converts wide webs of paper or board into narrow rolls up to 72" diameter. Speeds up to 1500 fpm on paper, 1000 fpm on board.

WRITE FOR INTERESTING LITERATURE



CAMERON MACHINE COMPANY
61 POPLAR STREET, BROOKLYN 2, N. Y.
MIDWEST OFFICE: 111 W. MONROE ST., CHICAGO 3, ILL.

New Catalogues and Publications

American Standards Association, 70 E. 45th St., New York 17, N. Y.—A revised list of 864 standards approved by ASA for use by United States industries has been issued. The new list includes many standards developed under war procedure which have been approved for peacetime use. Technical terms are defined, metals and other material specifications are given, and work and testing methods specified, as well as, engineering data and industrial safety information compilations. Price listings for the desired data and order numbers are given in this list which includes the pulp and paper industry.

Carbide and Carbon Chemicals Corp. (unit of Union Carbide and Carbon Corp.), 30 E 42nd St., New York 17, N. Y.—Available from any of the company's offices located in the major cities of the United States, the 31-page booklet entitled "Organic Nitrogen Compounds" presents detailed information on the properties, specifications, and uses of the nitrogen compounds manufactured by Carbide and Carbon. The publication gives adequate editorial descriptions and charts physical constants, comparative hygroscopicities, and neutralization curves. The compounds have various industrial uses in processes involving emulsifying, neutralizing, synthesizing, dissolving, and saponifying.

Dodge Mfg. Corp., Mishawaka, Ind.—Pertinent engineering data covering pillow blocks, hanger bearings, flanged units, and the new line of SC ball bearings are contained in this company's bulletin A-120. Selection tables are also presented in the booklet providing a convenient means for selecting the right bearing for any application within the size and load range of the line.

Duriron Co., Inc., The, Dayton 1, Ohio—Complete information covering dimensions and capacities, together with, installation drawings is contained in a new bulletin published by this company which describes the Durco corrosion-resistant fans for exhausting acid and other corrosive fumes. Description of the corrosion-resisting alloys of which fans are constructed is given, and the applications made of the fans including fume exhaust from laboratory hoods, hydrochloric acid etching units, rejection kettles, sulphuric acid chamber processes, absorbtion and drying towers, and Kjeldahl tubes are outlined.

Goodrich Co., The B. F., Akron Ohio—Catalogue Section 9780 has been issued by this company outlining all standard pipes and fittings lined with rubber under the Vulcalock process. Pulp and paper mills are among the many industries in which rubber-lined pipes and fittings are used. The lining materials described by this catalogue are used as protection against corrosive and abrasive materials flowing through standard wrought steel, wrought iron, cast iron, and Armco spiral welded pipe, all being under the specifications of the Vulcalock process.

Ingersoll-Rand Co., Phillipsburg, N. J.—A 10-page, two-color bulletin of interest to the chemical industry has recently been released. Well illustrated with exploded views and cross section drawings, and containing performance and dimensional tables, the bulletin describes pumps designed to handle many types of liquids under a wide range of capacities. The publication is designated as Form 7095 and is available on request from any Ingersoll-Rand branch office.

Latex Distributors, Inc., 80 Broad St., New York 4, N. Y.—An article under title of "January Special Report, Liquid Hevea Latex Production in the Far East" has been reprinted by the corporation and is available to industry. Arthur Nolan, vice president of the company, who wrote the study which originally appeared in *Rubber Report,* spent some time in the Far East studying the production requirements and allied problems there.

Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.—Book No. 2085, a 16-page, two-color presentation, provides detailed information on the Electro-fluid Drive, a packaged power unit manufactured by this company. Catalogue information, operational charts, and engineering specifications are contained in the booklet. It has use in the paper industry, among many industrial applications the power unit satisfies. It has been applied to agitators, barking drums, beaters and pulpers, conveyors, and stock chests, as well as, in allied process equipment installations.

Lyon-Raymond Corp., Greene, N. Y.—Identified as Bulletin 220, a two-color publication which describes the Hydraulic Pallet Lift Truck manufactured by L-R, the booklet contains complete information, together with, photographic illustrations. The truck specifications are supplemented with operational data on pallet handling, construction recommendations for pallets, and material adaptability to pallet form. The booklet is of general interest to anyone concerned with material handling effectiveness and economy.

Mine Safety Appliances Co., Pittsburgh 8, Pa.—Skull guards, a protective requirement in industries where head hazards are encountered, are catalogued in Bulletin No. DK-13. For use in construction work, chemical industries, and other industries where head injuries are possible, the booklet describes the construction and sizing of this protective equipment.

Norton Co., Worcester, Mass.—Introductory information regarding the types of cylindrical grinders manufactured by Norton is available in a two-color folder which gives illustrative material and catalogue descriptions of the grinders. Additional data regarding the 4" Type C Grinder are available in Form 287; the 6" Type C Grinder in form 243 the 10" Type C Grinder in Form 1367; and the 14" and 16" Type C Grinders in Form 99. These forms can be obtained from the company upon request.

H. K. Porter Co., Inc. (Quimby Pump Div.), 1932 Oliver Bldg., Pittsburgh 22, Pa.—An 8-page pamphlet, released recently, describes the close-coupled centrifugal pump, Model "Q," which is designed for capacities of 10 to 100 gpm. Selection tables for 60 cycle speeds and 50 cycle speeds are given, and dimensional charts, as well as, construction features are included.

% Proportioneers, Inc. %, 132 Codding St., Providence 1, R. I.—In 11-pages of descriptive information, the Pur-O-Cel water filter is presented by this company's publication, Bulletin 1550. Graphic diagrams of the process of filtering water (by utilizing thin mats of diatomaceous earth), filtration charts, and specification drawings are given together with, editorial description of the method now in use by filtration plants. Future use of the equipment and process will be extended to the chemical industry, and industries using cleaning fluids, and liquid soaps.

Ross Heater & Mfg. Co., Inc., 1430 West Ave., Buffalo 13, N. Y.—Size, weight, and dimensions are charted, and catalogue description of the Type "BCF" Lube Oil and Jacket Water Coolers are given in Bulletin No. 4922. Applications for the water coolers are included for small size Diesel and gas engines, reduction gears, thrust bearings, hydraulic presses, and other uses.

Roy Co., Milton, 1300 E. Mermaid Ave., Chestnut Hill, Philadelphia 18, Pa.—Handling materials such as hypochlorites, dyes, alum, sizing, melamine resins, and filter aids in the paper industry, the controlled volume chemical and high pressure pumps described in the 28-page publication issued by this company are presented. Operational features of the pumps are treated in detailed descriptive matter and illustrations, together with, catalogue data are given. Selection tables are part of the book's contents, combined with charts of construction materials which are graphically rated.

Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.—Maintenance hints for general purpose turbines are contained in a new handbook published by this company. The handbook is identified as B-3747, and it describes the operation of steam turbines and gives installation data. Directions for piping, joint sealing, and lubrication are given. Points to be checked and recorded during inspection of the turbines are listed; and under parts headings, repairs and adjustments are discussed. Emergency repair data for quick reference is also given.

Wheelco Instruments Co., 847 W. Harrison St., Chicago 7, Ill.—Educational Bulletin No. 5, an 18-page publication containing charts, tables, and diagrams, explains the measurement and automatic control systems for process application. The condensed presentation is entitled "Automatic Temperature Control Systems," and in separate sections of the booklet, placement and useful hints on the thermocouple are outlined, as well as, selection information given on thermocouple protecting tubes. ASME terminonolgy relating to processes and automatic control is also listed.

BOOKS

English-French and French-English Technical Dictionary—Covering metallurgy, mining, electricity, chemistry, mechanics, and sciences, this dictionary by Francis Cusset totals nearly 600 pages. The text is set two columns to the page—the English-French portion of it beginning with the word abatement and concluding with the expression zone of pressure; the French-English section, in turn, beginning with the word abaque and ending with zone de pression. There also is a short addendum of English-French and French-English words as well as a brief appendix.

Priced at $5.00 a copy, the publisher is the Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y.

Management Can Be Human—Harvey Stowers, Assistant to the President of Aircraft Industries Association of America, Inc., is the author of this volume. In his preface, Mr. Stowers states that in this book he "has attempted to set down the basic principles for building better human relations and better understanding between management and men and to show by the use of case histories how these principles can be successfully applied." These principles and case histories are covered in fifteen chapters: namely, Get Up and Get Going, Cut the Apple in Half, Your Ace in the Hole, Use a Baton—Not a Club, Thorns in the Crown of Human Relations, Let Them Look at Their Future, Mental Machinery Needs Oil—Not Sand, Stand in Their Shoes, Give Them the D.S.C., Unmined Gold, Success is Fragile—Handle with Care, Accentuate the Positive, Guns of Supervision Need Ammunition, Vitamins of Human Understanding, and Develop Team Power—Not Man Power. Totaling 131 pages, and with a page size of 5½ in. by 8½ in., the book is priced at $1.50 a copy. Its publisher is McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 18, N. Y.

MURCO

SCREW CONVEYORS AND FLIGHTS

MADE TO CUSTOMERS SPECIFICATIONS

CONTINUOUS one-piece construction — welded not cast, MURCO screw conveyors and flights are accurately and substantially made by the specially developed technique of manufacturing, embodying special features that contribute to strength and long life. No laps or rivets. Made in stainless steel and other metals, in various diameters, lengths and pitch.

Send us your specifications for quotation.

D. J. MURRAY MANUFACTURING CO. WAUSAU · WISCONSIN

WATERBURY FELTS

are made by

H. Waterbury & Sons Co.

Oriskany, New York

PERFORATED METAL *Screens*

Precision perforations in all sizes for large production and screen durability.

Copper • Steel
Monel • Stainless Steel
Chemical Resisting Alloys

The Harrington & King PERFORATING CO.

5654 Fillmore St., Chicago 44, Ill. 144 Liberty St., New York 6, N.Y.

PEERLESS Hydro-Foil PUMPS

Move huge volumes of water against low and medium heads

To Rapidly Move and Re-move Maximum Amounts of Water.
— PEERLESS MIXED-FLOW PUMPS

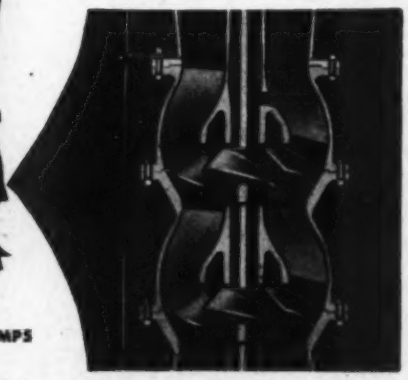
Most modern principles of aero and hydro-dynamic design are embodied in Peerless Mixed-Flow pump design and construction, attaining new high efficiencies in large volume water lift and lowering overall maintenance and pumping costs.

Numerous successful applications of Peerless Mixed-Flow Pumps include: drainage; sewer and flood control service; de-watering; irrigation water diversion; flooding of agricultural lands; industrial and process work including condensers, circulation of liquors, etc.

PEERLESS MIXED-FLOW PUMPS

CAPACITIES: UP TO 220,000 G.P.M.

Cutaway view of Mixed-Flow multi-stage pump impeller and bowl construction revealing high efficiency impellers utilized for more economical water lift.



PROPELLER TYPE PUMPS

Peerless Pumps, embodying the Hydro-Foil principle, are also available in the propeller type and are capable of handling identical capacities of the Peerless mixed-flow pump. Request Bulletin B-148 on design, construction and application data of these two outstanding types of Peerless Pumps, for large-volume water pumping.

PEERLESS PUMPS

PEERLESS PUMP DIV. · FOOD MACHINERY CORP.

CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

(All Prices Are Nominal)

	per cwt.
Blue Overalls	8.50 to 9.00
Corduroy, Men's	5.25 to 5.75
Corduroy, Ladies'	5.25 to 5.75
Washables, No. 1	5.25 to 5.75
Percales	7.25 to 7.75
Light Prints, No. 1	7.00 to 7.50
Khaki Cuttings—	
Bleachable	7.50 to 8.00
Unbleachable	6.50 to 7.00
New White Canvas	10.00 to 10.50
New Mixed Blacks	4.50 to 5.00
Canton Flannels, Bleached	10.50 to 11.00
Shirt Cuttings—	
New White No. 1	11.50 to 12.50
White Shrunk	9.00 to 10.00
Silesias No 1	8.50 to 9.00
New Unbleached	12.00 to 13.00
Fancy	6.50 to 7.00
Linen Cuttings—	
American	9.00 to 10.00
White	15.00 to 16.00
Grey	14.00 to 15.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

(All Prices Are Nominal)

	per cwt.
Roofing—	
No. 1	2.10 to 2.20
No. 2	2.00 to 2.10
No. 3 and No. 4	1.90 to 2.00
Twos and Blues—	
Repacked	4.00 to 4.50
Thirds and Blues—	
Repacked	3.50 to 4.00
Miscellaneous	3.00 to 3.50
Whites, No. 1—	
Repacked	5.00 to 5.50
Miscellaneous	4.50 to 5.00
White, No. 2—	
Repacked	4.00 to 4.50
Miscellaneous	3.50 to 4.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shoppers	

ROPE and BAGGING

f.o.b. and ex dock New York City

(All Prices Are Nominal)

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	5.00 to 5.25
Wool Tares—	
Light	5.00 to 5.5
Heavy	5.25 to 5.5
No. 1 Scrap Bagging	4.00 to 4.5
Manila Rope—	
No. 1 large	6.50 to 6.7
No. 1 small	5.50 to 5.7
Sisal Rope—	
No. 1 large	5.50 to 5.75
No. 1 small	5.00 to 5.25
New Burlap Cuttings	5.50 to 6.00
Jute Threads—	
Foreign (Nom.)	6.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	4.50 to 5.0
No. 2 sisal	4.00 to 4.5
Soft jute	5.50 to 6.0
Mixed	2.25 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York

(All Prices Are Nominal)

	per ton
Shavings—	
Hard White Env. Cuts	135.00—
Hard White, No. 1	115.00—
Soft White, No. 1	100.00—
Soft White, One-cut	110.00—
Soft White, Misc.	90.00—
Fly Leaf, No. 1	50.00—
Fly Leaf, Woody, No. 1	45.00—
No. 2 Mixed Col. Woody	30.00—
Flat Stock—	
No. 1 Heavy Books and Magazines	48.00—
Mixed Books	37.50—
Ledger Stock—	
No. 1 White	75.00 to 80.00
No. 1 Mixed (Colored)	65.00 to 70.00
Manilas—	
New Env. Cuttings	80 00—
New Env. Cuts, One-Cut	—
Extra Manilas	—
Manilla Tab Cards, Free of Ground Wood	75.00 to 80.00
Colored Manila Tab Cards	60.00 to 65.00
Kraft—	
New Envelope Cuttings	90.00—
Tripled Sorted No. 1 100%	70.00 to 75.00
New 100% Cor. Cuts	65.00 to 70.00
No. 1 Old Assorted	55.00 to 60.00
News—	
White Blank	66.00 to 68
No. 1 Baled	29.00 to 30.00
Old Corrugated Containers	31.00 to 32.00
New Corrugated Cuts	38.00 to 40.00
Mill Wrappers	27.00 to 28.00
Box Board Chips	15.00 to 16.00
No. 1 Mixed Paper	21.00 to 22.00

CHEMICALS

f.o.b. shipping point

(All Prices Are Nominal)

Alum (Papermakers)—	
Lump, cwt.	4.25—
Ground, cwt.	4.60—
Powdered, cwt.	4.40—
Blanc Fixe—	
Pulp, bulk, ton	46.00 to 46.50
Dry, barrels, pound	06.00 to —
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb. (N)	47.00 to 50.00
Argentine, lb. (N)	50.00 to 52.00
China Clay—	
Domestic Filler Bulk (mine) ton	8.50 to 15.00
Domestic Coating Bulk (mine) ton	12.00 to 22.00
Imported (ship side) Bulk (lump) ton	22.00 to 25.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.0
Gelatine (silicin), lb.	1.60 to 1.65
Glyc. (C.P.) drums, lb.	.55 to .55½
Litharge, powd., bbl. lb.	.09¾ to .10¾
Rosin (Gum)—	
New York, per 100 lbs.	
E	10.50—
F	11.25—
G	11.25—
WW	11.25—
Rosin (Wood), carlots	7.50—
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	28.00 to —
Soda Ash—	
Bulk (works), cwt.	.90 to .9
Paper Bags, cwt.	1.05 to 1.1
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.50—
Ground and flake, drums, cwt.	2.90 to 3.00
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works), cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	5.87—
Pearl, barrels, cwt.	5.93—
Paper (Sp.) bags, cwt.	5.93—
Powdered, barrels, cwt.	6.02—
Sulphur (Crude) (Mine) bulk, long ton	16.00 to —
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 28.00
Canadian	33.00 to 45.00
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .06¾
Calcium Pig., bbls., lb.	.05 to .05¼
Zinc Sulphide bbls., lb.	8.25 to 8.50

WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances, are:

(All Prices Are Nominal)

Bleached sulphite, Swedish	120.00—
Bleached sulphite, Finnish	165.00—
Unbleached sulphite, dom.	105.00—
Easy bleaching sulphite	—
Unbleached sulphite, Swed.	94.50—
Unbleached sulphite, Fin.	132.50—
Unbleached sulphite, dom.	105.00—
Unbleached kraft, Swedish	89.00—
Unbleached kraft, Finnish	132.50—
Unbleached kraft, northern	102.50—
Unbleached kraft, southern	90.00—
Bleached sulphate, Swedish	124.50—
Bleached soda, domestic	105.00 to 110.00
Sulphite screenings, dom.	—
Sulphate screenings, dom.	—
Groundwood, domestic and Canadian	75.00 to 80.00

PAPER

f.o.b. New York City

(All Prices Are Nominal)

Boards—	
Binders	94.00—
Chip	67.50—
Chip, tube and can	70.00—
Chip, full-blending	72.50—
Chip, sgl. mla. lined	82.50—
Coated, white patent .016	101.50—
.020 and heavier	90.00—
Kraft liner	84.00—
Filled News	70.00—
Container	84.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	—
B Grade E. F.	—
C Grade E. F.	—
D Grade E. F.	—
No. 2 Uncoated Offset 4 sides, White	—

Coated White (Trimmed 4 sides)

No. 1 Glossy	—
No. 2 Glossy	—
No. 3 Glossy	—
No. 4 Glossy	—
C1S Offset	—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—

	per cwt. 20 lb.	16 lb
Extra 100% Rag	—	
100% Rag	—	
75% Rag	—	
50% Rag	—	
25% Rag	—	
Rag Content Ledger—		
Extra 100% Rag	—	
100% Rag	—	
85% Rag	—	
75% Rag	—	
50% Rag	—	
25% Rag	—	

Sulphite Bond—	per cwt. 20 lb.	16 lb.
Air dry, watermarked	—	
No. 1 (M.F.) watermarked	—	
No. 2 (M.F.) watermarked	—	
Plain (M.F.) unwatermarked	—	

Sulphite Ledger—	per cwt. Zone 1
No. 1 (M.F.) watermarked	—
No. 2 (M.F.) watermarked	—
Plain (M.F.) unwatermarked	—

Glassine (f.o.b. mill)—	per cwt.
Embossed (25 lbs. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof—	
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

News—	per ton
Rolls, Standard (Contract)	84.00—
Rolls (Spot)	(Nominal)
Sheets	103.00—

Tissues (Carlots)—	per ream
White No. 1	1.35—
White No. 2	—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	—
Manila	—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.70—
Napkins, full crepe and smb'sed (12½ lb. to M shts.) per cs.	.70—
Toilet, Bleached (M shts.) per cs.	7.00—
Toilet, Unbleached (M shts.) per cs.	5.50—

Towels—	per case
Bleached	4.25—
Unbleached	3.75—

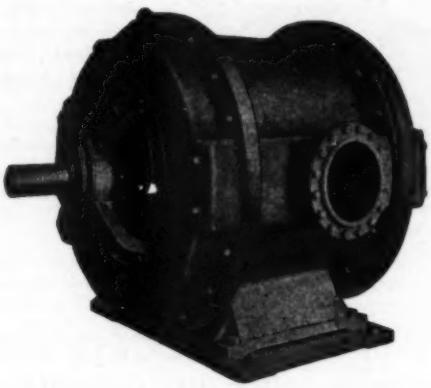
Wrappings (Kraft)—	per cwt.
Super-Standard	7.00 to 7.50
No. 1 Wrapping	6.50 to 7.00
Standard Wrapping	6.25 to 6.75
Standard Bag	6.25 to 6.75
Variety Bag	—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)

Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only (10,000 lbs.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers—	
Com. Gr' Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	—
Envy. Mla., Sub. 16-28 (No. 2)	—
Envy. Mla. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B30 lb.	—
Grade A-22 lb.	—

ONLY NASH VACUUM PUMPS HAVE ALL THESE FEATURES



One Moving Element. Non-pulsating Vacuum. No Internal Wearing Parts. No Internal Lubrication. Handles Liquid With Air. No Expert Attendance. Constant Efficiency. Low Maintenance Cost.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

Take A Look . . .

8 Publications for the Papermaker

Modern Pulp and Paper Making $7.25
G. S. Witham, Sr.
Second Edition, Revised and Enlarged. A book of 704 pages, written for machine tenders, beater men, and other practical mill workers, as well as for engineers, technologists and executives.

Trouble on the Paper Machine ..... .75
Archie McCaffery
A monograph—published in convenient pocket-sized edition. Bulk rates, in groups of ten or more, 50 cents per copy.

Pulp Bleaching (A Symposium) ..... .50

Technology of Papermaking Fibers ..... .50

Lessons in Paper Making—Part 1 ..... .75
Harry Williamson

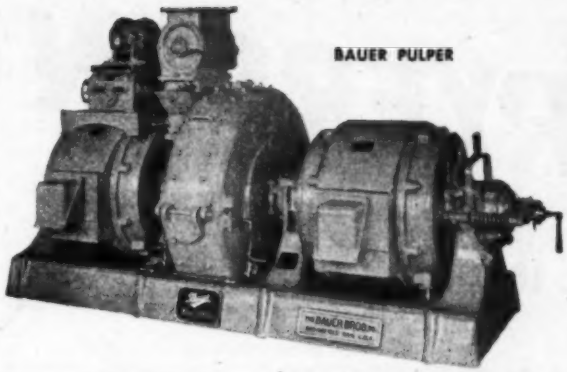
Lessons in Paper Making—Part 2 ..... .75
Harry Williamson

Drying of Paper on the Machine 1.50
B. M. Baxter

Procedure Handbook of Arc Welding Design and Practice 1.50
Seventh Edition—latest information on all phases of arc welding—1308 pages—1810 illustrations. Standard text in hundreds of schools and colleges. ($2.00 outside U.S.)

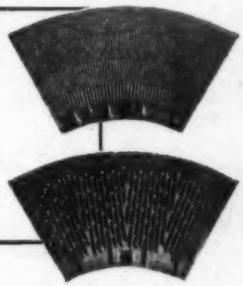
Now available postpaid; mail check with order to

FRITZ PUBLICATIONS, INC.
59 E. Van Buren St., CHICAGO 5, ILL.



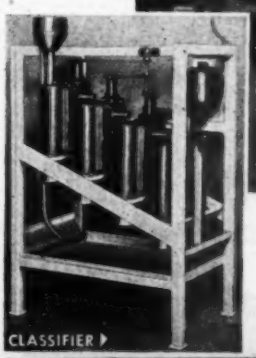
BAUER PULPER

KNOW YOUR STOCK



Scientific study of your stock may result in new or improved grades. Such studies are daily being conducted at the Bauer Fibre Products Laboratory for mills across the country. In fact, the "lab" is booked solid for weeks and weeks ahead. It might be to your advantage to forward samples of your stock for study—perhaps send someone to take part in the various tests that would be made.

VIEW OF EVER-BUSY BAUER LABORATORY



CLASSIFIER

● *Builders of Bauer single and double disc pulpers for salvage of rejects and screenings and processing of semi-chemical fibre.*

Bauer
THE BAUER BROS. CO
SPRINGFIELD, OHIO

RYERSON STEEL

IN STOCK for prompt shipment—Call your nearest Ryerson dealer.

Partial list of Ryerson products:

Alloy Steels	Boiler Fittings	Threaded Rods
Bars—Shapes	Reinforcing	Rivets—Nuts
Structurals	Floor Plate	Chain—Wire
Rails—Plates	Tool Steel	Tubing
Sheets—Strip		
Shafting—Bolts	Large stocks in a complete range of sizes and analyses. Write for a current Ryerson Stock List.	
Stainless		

Ryertex Bearings Laminated Plastic

Ideal for suction box covers, suction pipe covers, forming boards, doctor blades, and all types of water, oil or grease lubricated bearings. Write for details on any specific bearing application.

Joseph T. Ryerson & Son, Inc., Steel-Service Plants: Chicago, Milwaukee, Detroit, St. Louis, Cincinnati, Cleveland, Pittsburgh, Philadelphia, Buffalo, New York, Boston.

IDAHO *Potato Starch*

"THE FINEST MADE"

MAGIC VALLEY PROCESSING COMPANY
OF IDAHO

•

ST. ANTHONY STARCH COMPANY, INC.
OF IDAHO

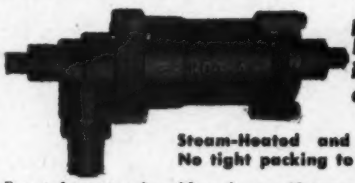
•

MENAN STARCH COMPANY, INC.
OF IDAHO

DISTRIBUTED BY
AMERICAN KEY PRODUCTS, INC.
15 PARK ROW • NEW YORK 7, N. Y.

GUARANTEED LEAK-PROOF "DIAMOND"

REVOLVING JOINTS



permanently end leaking and stuffing box trouble on all kinds of

Steam-Heated and Water-Cooled Rolls
No tight packing to act as brake on roll.

Patented construction. Many in use 10 years or more. Specially compounded molded gasket lasts up to 15 months in severest service—easy, quick and inexpensive to replace. We also manufacture leak-proof SWING JOINTS and BALL JOINTS. Bulletin and price list upon request.

406 Market St. • DIAMOND METAL PRODUCTS CO. • St. Louis 2, Mo.

CHEMIPULP PROCESS INC.

CHEMICAL PULP MILL ENGINEERS

500 Woolworth Building, Watertown, N. Y.
3311 First Avenue South, Seattle, Wash.
Associated with CHEMIPULP PROCESS LIMITED, Montreal, Que.

MISCO

STAINLESS STEEL CASTINGS

for all equipment exposed to corrosion by sulphite acids or other corrosive agents

MICHIGAN STEEL CASTING CO., DETROIT 7, MICH.

Read . . .

THE PAPER INDUSTRY AND PAPER WORLD

for

Constructive Articles—Selected News—Features

CONFIDENTIAL
EMPLOYMENT SERVICE
FOR PAPER AND PULP MILLS
WE INVITE CORRESPONDENCE (Confidential) WITH EMPLOYERS SEEKING EXECUTIVES AND EXECUTIVES SEEKING POSITIONS
CHARLES P. RAYMOND SERVICE, INC.
PAPER MILL DEPARTMENT
294 WASHINGTON STREET BOSTON 8, MASS.

WANTED—Experienced Master Mechanic for board mill in Northern New Jersey. An excellent opportunity for a permanent position at a good salary. State age, experience, etc. Address Box 428, Fritz Publications, Inc.

WANTED—Experienced Paper Mill Engineer, with knowledge of general engineering work, in long established consulting engineer's office, specializing in pulp, paper mills and power plants. Location Manhattan. Excellent opportunity for right man. State complete details, age, experience, availability and salary desired. Address Box 433, Fritz Publications, Inc.

FOR SALE—One Noble & Wood cycle beater for laboratory pulp testing and hydrating. Accurate control of roll. Purchased 1941. Used very little. In good condition. Complete except motor. Priced for immediate sale. Address Box 434, Fritz Publications, Inc.

WANTED — No. 1-A or No. 2 Bahr (Marion, Ind.) disc refiner. Address Box 435, Fritz Publications, Inc.

Index to Advertisers

When writing them, please mention The Paper Industry and Paper World

Refer to the Paper and Pulp Mill Catalogue and Engineering Handbook at your mill office, for complete listing of all advertisers' products.

Allis-Chalmers Mfg. Co. 1532
American Car & Foundry Co. .....
American Cyanamid Co., Industrial Chemicals Division 1525
American Defibrator, Inc. .....
American Hoist & Derrick Co. 1564
American Key Products, Inc. 1664
American Paper Machinery & Engr. Works, Inc. .....
American Resinous Chemicals Corp.
Appleton Machine Co., The.....
Appleton Wire Works, Inc. 1528
Appleton Woolen Mills 1554
Armstrong Machine Works .....
Asten-Hill Mfg. Co. 1631
Atkins and Company, E. C. 1655
Atlantic Steel Corp. .....
Aurand Mfg. & Equipment Co. .....
Aurora Pump Company.....

Bagley & Sewall Co., The..... 1556
Bailey Meter Company .....
Baldwin-Duckworth Div. of Chain Belt Company 1605
Bauer Bros. Co., The..... 1663
Becco Sales Corporation..... 1569
Beloit Iron Works..... 1523
Bennett & Co., Inc., Frank P. 1646
Bird Machine Company..... 1603
Black-Clawson Co., The..... 1558
Bowser, Incorporated 1655
Bowsher Co., The N. P. 1659
Brown Instrument Co., The.....1562, 1629

Calco Chemical Division, American Cyanamid Company .....
Cameron Machine Co. 1659
Carthage Machine Co. 1653
Chain Belt Company..... 1605
Chamberlain Engineering Corp. .....
Chemipulp Process, Inc. 1664
Cheney-Bigelow Wire Works.....
Chicago Bridge & Iron Co. 1549
Chicago Electric Company 1650
Chicago Metal Hose Corp. .....
Chromium Corp. of America.....
Clark Tructractor Division of Clark Equipment Company .....
Classified Advertising 1664
Cleveland Tramrail Div., The Cleveland Crane & Engineering Co. 1611
Cooper Alloy Foundry Co., The..... 1581
Crane Co. 1613

Darnell Corporation, Ltd. 1654
De Laval Steam Turbine Co. .....
DeZurik Shower Company 1633
Diamond Alkali Company 1563
Diamond Iron Works, Inc. .....
Diamond Metal Products Co. 1664
Dilts Machine Works 1558
Dodge Manufacturing Corporation... 1617
Dow Chemical Co., The..... 1579
Downingtown Mfg. Co. .....4th Cover
Draper Brothers Company 1534
du Pont de Nemours & Co., E. I. ...
Duriron Co., Inc., The.....

Eastern Stainless Steel Corp. 1557
Eastwood-Nealley Corporation 1648
Electric Machinery Mfg. Co. 1535
Electric Steel Foundry .....
Elwell-Parker Electric Co., The..... 1566
Engineer Company, The..... 1531
English China Clays Sales Corp. 1640

Fairbanks, Morse & Co. .....
Ferguson & Co., Hardy S. 1653
Fitchburg Screen Plate Co., Inc. ....
Fleishel Lumber Company 1647
Flexible Steel Lacing Co. .....
Foxboro Company, The.....
Fritz Publications, Inc. 1663, 1666

Garlock Packing Co., The.....
Gates Rubber Company..... 1576
General Chemical Company 1551
Goulds Pumps, Inc. 1621
Grinnell Company, Inc. .....

Hammel-Dahl Company .....
Hanchett Manufacturing Co. 1631
Hardy & Son, George F. 1646
Harper Company, The H. M. .....
Harrington & King Perforating Co. 1661
Harris-Seybold Company .....2nd Cover
Hercules Powder Company, Inc. ....
Hood Rubber Company.....
Hooker Electrochemical Co. .....
Hooper & Sons Co., Wm. E. 1585
Hudson-Sharp Machine Company.... 1631
Hunt Machine Co., Rodney..... 1654
Huyck & Sons, F. C. 1580
Hyster Company .....

Improved Paper Machinery Corp. ... 1529
Ingersoll-Rand Company .....
Ingersoll Steel Div., Borg-Warner Corporation .....
International Nickel Co., Inc. 1578

Jeffrey Mfg. Co., The.....
Jenkins Bros. 1577
Johnson Corporation, The.....
Jones & Sons Company, E. D. 1609
Jones Foundry & Machine Co., W. A. 1583

Kalamazoo Tank & Silo Co. 1659
Kalamazoo Vegetable Parchment Co.
Kelco Company 1601
Knight, Maurice A. .....
Kohler System Co., The.....
Koppers Company, Inc., Bartlett-Hayward Division 1559

Langston Co., Samuel M. 1653
Layne & Bowler, Inc. 1641
Lewellen Manufacturing Co. .....
Lindsay Wire Weaving Co., The.... 1635
Link-Belt Company..... 1573
Lockport Felt Company..... 1649
Lodding Engineering Corp. 1625
Lunkenheimer Co., The 1636

Magnus Chemical Co., Inc. 1643
Mason-Neilan Regulator Co. 1627
Mathieson Alkali Works, Inc. .....
Michigan Steel Casting Co. 1664
Midwest Piping & Supply Co., Inc. .. 1586
Monsanto Chemical Company 1574
Morehead Manufacturing Co. 1653
Morey Paper Mill Supply Co. .....
Mt. Vernon-Woodberry Mills, Inc. ..
Murray Mfg. Co., D. J. 1661

Nash Engineering Co., The..... 1663
Natrona Alkali Company..... 1553
National Aluminate Corporation.....
National Bearing Division, American Brake Shoe Company..... 1526
National Oil Products Co. 1619
National Safety Council, Inc. 1624
Naylor Pipe Company.....
Nichols Engr. & Research Corp. ....
Norma-Hoffmann Bearing Corp. 1657
Northwest Engineering Co. .....
Norton Company .....

Oakite Products, Inc 1657
Ohio Injector Co., The..... 1543
Oliver United Filters, Inc. .....
Orr Felt & Blanket Co., The..... 1560
Owen Bucket Company, The..... 1645

Paper & Industrial Appliances, Inc. .
Patterson Foundry & Mach. Co..1st Cover
Peerless Pump Div., Food Machinery Corporation 1661
Perfecting Service Company..... 1635
Perkins & Son., Inc., B. F. 1568
Permutit Company, The.....
Pittsburgh Piping & Equipment Co.. 1567
Poole Foundry & Machine Co. 1657
Powell Company, The Wm. 1556
Pusey & Jones Corp., The 1539

Raymond Service, Inc., Charles P. . 1664
Reading Chain & Block Corp. 1552
Reed-Prentice Corp. .....
Reichhold Chemicals, Inc. 1582
Reliance E'ectric & Engr. Co. 1575
Research Corporation .....
Resinous Products & Chemical Co. .. 1541
Rogers & Co., Samuel C. .....
Roofing Machinery Mfg. Co. .....
Ross Engineering Corp., J. O. .....
Ross Heater & Mfg. Co., Inc. .....
R-S Products Corporation .....
Ryerson & Son, Inc., Joseph T. 1664

Sandusky Foundry & Machine Co. ..
Sandy Hill Iron & Brass Works, The 1653
Shartle Bros. Machine Co. 1558
Shuler & Benninghofen..... 1615
Smith & Winchester Mfg. Co. 1635
Smith Corporation, A. O. 1524
Solvay Sales Corporation.....
Sprout, Waldron & Co. .....
Standard Oil Co. (Indiana)..... 1565
Stebbins Engr. & Mfg. Co. 1651
Stein, Hall & Company, Inc. .....
Stickle Steam Specialties Co. .....
Sutherland Refiner Corporation..... 1547
Swenson Evaporator Company..... 1623

Taylor Forge & Pipe Works..... 1607
Timken Roller Bearing Co., The..... 1545
Titanium Pigment Corporation.....
Torrington Co., Bantam Bearings Division 1530
Towmotor Corporation .....
Trent Tube Manufacturing Co. 1633
Turner Halsey Company.....

U. S. A., Treasury Dept. .....
Union Machine Company .....
Union Pacific Railroad Company..... 1584
U. S. Stoneware Co. 1632

Valley Iron Works Company.....
Vanderbilt Co., Inc., R. T. 1570

Waldron Corporation, John.....
Warren Steam Pump Co., Inc. 1634
Waterbury & Sons Co., H. 1661
Waterbury Felt Co., The.....
Weyerhaeuser Timber Co. 1533
Whiting Corporation 1623
Whittaker, Clark & Daniels, Inc. .....3rd Cover
Williams and Co., C. K. 1659
Worthington Pump & Machinery Corporation 1561
Wyandotte Chemicals Corporation..

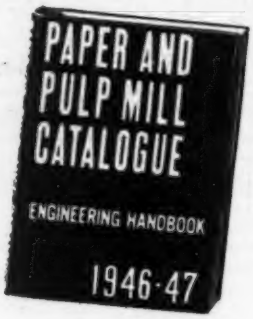
Youngstown Welding & Engineering Company, The .....

the 1946-47

PAPER AND PULP MILL CATALOGUE ENGINEERING HANDBOOK

IS AVAILABLE

AT YOUR MILL OFFICE



BIGGER—BETTER CATALOGUE SECTION

Prominent manufacturers of pulp and paper mill equipment and supplies present in these descriptive pages important information about their products.

COMPLETE CROSS-INDEXED BUYER'S GUIDE

Complete cross-indexed buyer's service listing sources of purchase of machinery, equipment, chemicals and supplies and other important information.

INCREASED—VALUABLE ENGINEERING DATA

Pertinent tables, charts and other authoritative data relative to the proper operation and maintenance of pulp and paper mills.

These firms describe their products in the 1946-47 edition

Allington & Curtis Mfg. Co., The
Allis-Chalmers Mfg. Company
American Cyanamid Company (Industrial Chemicals Div.)
American Defibrator, Inc.
American Paper Mach'y & Engr. Works, Inc.
Appleton Machine Co., The
Armour & Company
Armstrong Machine Works
Atkins & Company, E. C.
Atlantic Steel Corporation
Aurora Pump Co.

Bagley & Sewall Company, The
Bauer Bros. Company, The
Becco Sales Corporation
Beloit Iron Works
Biggs Boiler Works Co., The
Bird Machine Co.
Black-Clawson Co., The
Blaw-Knox Div. (Blaw-Knox Co.)
Blickman, Inc., S.
Bowser, Inc.
Buffalo Forge Company
Buffalo Pumps, Inc.
Bufflovak Equipment Division (Blaw-Knox Co.)
Bulkley, Dunton Pulp Co., Inc.

Cameron Machine Company
Carbonite Metal Co., Ltd.
Carthage Machine Company
Cash Company, A. W.
Chemipulp Process, Inc.
Chicago Bridge & Iron Co.
Chicago Electric Company
Clark-Aiken Company, The
Control Equipment Corporation

Doublin Company
DeZurik Shower Company
Dilts Machine Works
Dow Chemical Company, The

Downingtown Mfg. Co.
Dresser Industries, Inc.
Duriron Company, Inc., The

Electric Steel Foundry
English China Clays Sales Corp.

Falk Corporation, The
Farrel-Birmingham Co., Inc.
Fitchburg Screen Plate Co., Inc.
Fleishel Lumber Company
Foote Bros. Gear & Mch. Corp.
Foster Wheeler Corporation
Foxboro Company, The
Fuller Brush Company, The

Garlock Packing Company, The
General American Transportation Corporation
Gibbs-Brower Company, Inc.
Glen Falls Machine Works, Inc.
Glidden Company, The
Golden-Anderson Valve Specialty Company
Goslin-Birmingham Mfg. Co., Inc.
Graver Tank & Mfg. Co., Inc.
Gruendler Crusher & Pulv. Co.
Gwilliam Company, The

Hanchett Manufacturing Co.
Harris-Seybold Company
Hauser-Stander Tank Co., The
Hercules Powder Company, Inc.
Hermann Mfg. Co., The
Hewitt Machine Co., Inc., J. W.
Hills-McCanna Company
Holyoke Machine Company

Improved Paper Mchy. Corp.
Infilco, Inc.

James Mfg. Co., D. O.
Jeffrey Mfg. Co., The
Johns-Manville
Johnson & Carlson

Johnson Corporation, The
Jones & Sons Company, E. D.
Jones Fdry. & Mch. Co., W. A.

Kalamazoo Tank & Silo Co.
Klemp Company, Wm. F.
Kohler System Company, The
Kut Kwick Tool Company, Inc.

Lancaster Iron Works, Inc.
Langston Company, Samuel M.
Lawrence Mch. & Pump Corp.
Leader Iron Works, Inc.
Link-Belt Company
Lovejoy Flexible Coupling Co.

Mason-Neilan Regulator Co.
Maxson Automatic Mchy. Co.
Merrick Scale Mfg. Co.
Michigan Pipe Company
Monsanto Chemical Company
Morris Machine Works
Moyno Pump Div., Robbins & Myers, Inc.
Murray Mfg. Co., D. J.

National Aluminate Corp.
National Casein Sales
Naylor Pipe Company
Nekoosa Fdy. & Mch. Wks., Inc.
Nichols Eng. & Research Corp.
Noble & Wood Mch. Co., The
Norma-Hoffmann Bearings Corporation
Northern Engineering Works

Ohio Grease Company, The
Oliver United Filters, Inc.

Paper & Industrial Appl., Inc.
Paper Makers Chem. Dept. (Hercules Powder Co., Inc.)
Pennsylvania Salt Mfg. Co.
Perkins & Son, Inc., B. F.
Pittsburgh Piping & Eqpt. Co.

Porter Company, Inc., H. K.
Powers Regulator Co., The
Pusey & Jones Corporation, The

Record Fdy. & Machine Co.
Reichhold Chemicals, Inc.
Research Corporation
Robbins & Myers, Inc.
Rollway Bearing Company, Inc.
Roots-Connersville Blower Corp.
Ross Engineering Corp., J. O.

Sandusky Fdy. & Mch. Co.
Sandy Hill Iron & Brass Works
Schutte & Koerting Company
Seybold Div. Harris-Seybold Co.
Shartle Bros. Machine Co.
Simonds Worden White Co.
Simpson Co., The Orville
Sinclair Company, The
Solvay Sales Corporation
Spraying Systems Company
Sprout, Waldron & Company
Stainless Steel Division, Pittsburgh Piping & Eqpt. Co.
Steamaire Company
Stebbins Eng. & Mfg. Co.
Stickle Steam Specialties Co.
Sullivan Division, Joy Mfg. Co.
Swenson Evaporator Company

Taylor Forge & Pipe Works
Trent Tube Mfg. Co.
Trimbey Machine Works
Tube Turns, Inc.
Twin Disc Clutch Company

Valley Iron Works Company

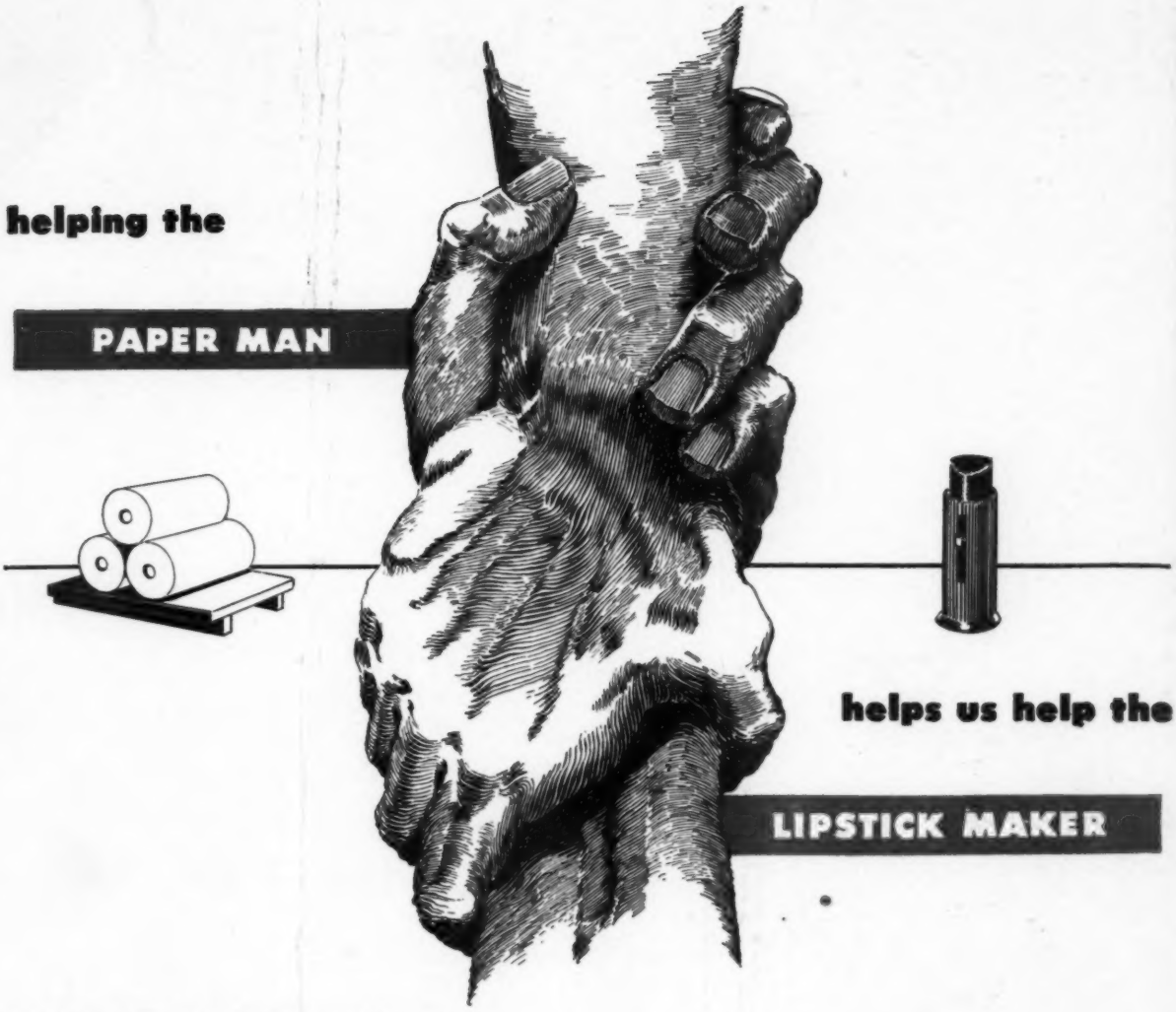
Waldron Corporation, John
Wallace & Tiernan Co., Inc.
Warren Steam Pump Co., Inc.
Westinghouse Electric Corp.
Whiting Corporation
Wiley Alloy Tube Company

Mention the PAPER AND PULP MILL CATALOGUE when making inquiries.

FRITZ PUBLICATIONS, Inc. 59 East Van Buren Street CHICAGO, ILLINOIS

helping the

PAPER MAN



helps us help the

LIPSTICK MAKER

Whittaker sells minerals, colors and pigments to a lot of different users—and that's good for you. Surprising how many times a product or grade we've developed for one industry has helped us serve some unrelated field better. Call it perspective, diversification, over-all experience, or what you will—fact is it's an important *plus* that Whittaker offers along with the quality standards and controls you'd expect from any good house. Want help on some specific problem? Contact a Whittaker sales representative, or write: Whittaker, Clark & Daniels, Inc., 260 West Broadway, New York 13, N. Y.

...and you

ALUMINUM STEARATE • ASBESTOS • BARIUM SULFATE • BARYTES • BENTONITE • BLACKS • BLANC FIXE • CALCIUM CARBONATE • CALCIUM SULFATE • CHALK • CHROMIUM OXIDE GREEN • CLAYS, ENGLISH AND DOMESTIC • DIATOMACEOUS EARTH • GRAPHITE • IRON OXIDE • KIESELGUHR • LIME • MAGNESIA • MAGNESIUM CARBONATE • MAGNESIUM OXIDE • 10 MICRON MAGNESIUM SILICATE • MICA • QUARTZ • STEARATES • TALC • UMBERS • VENETIAN RED • WHITING • ZINC STEARATE

EST. WHITTAKER 1990

MINERALS COLORS PIGMENTS

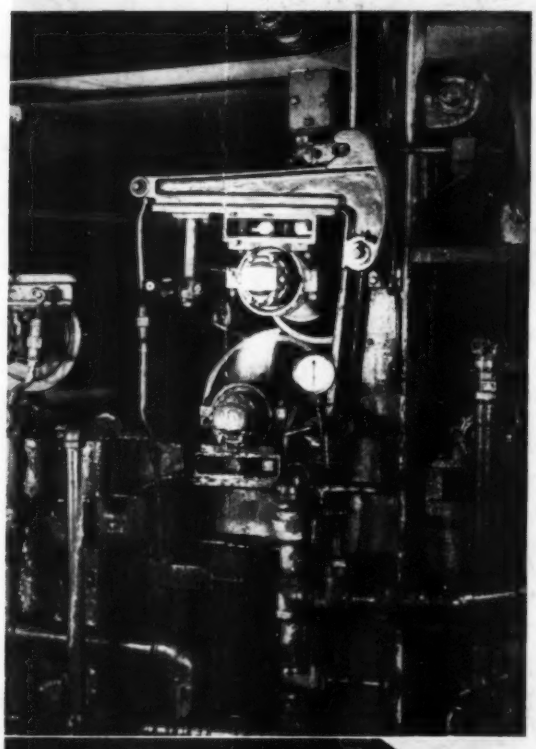
SUCTION-EXTRACTOR

Exclusively

A Downingtown Product

Following the success of the Downingtown Plain Extractor, we went one step farther, with the pioneering and patenting of the Suction-Extractor in 1938. This roll is a combination of the Extractor and the Suction Roll, and gives best results when installed following a plain Extractor, as pictured below. The combination safely removes large volumes of water, compacts the sheet and strengthens it at a point where it is easily pressed. Air bubbles are removed and the layers of the sheet sealed together. Many of the mills that installed a plain Extractor alone, as pictured at right, have since ordered Suction-Extractors. Catalogs on request.

DOWNINGTOWN MANUFACTURING CO.
DOWNINGTOWN, PA.



DOWNINGTOWN

Designers & Builders
Paper Making Machinery